AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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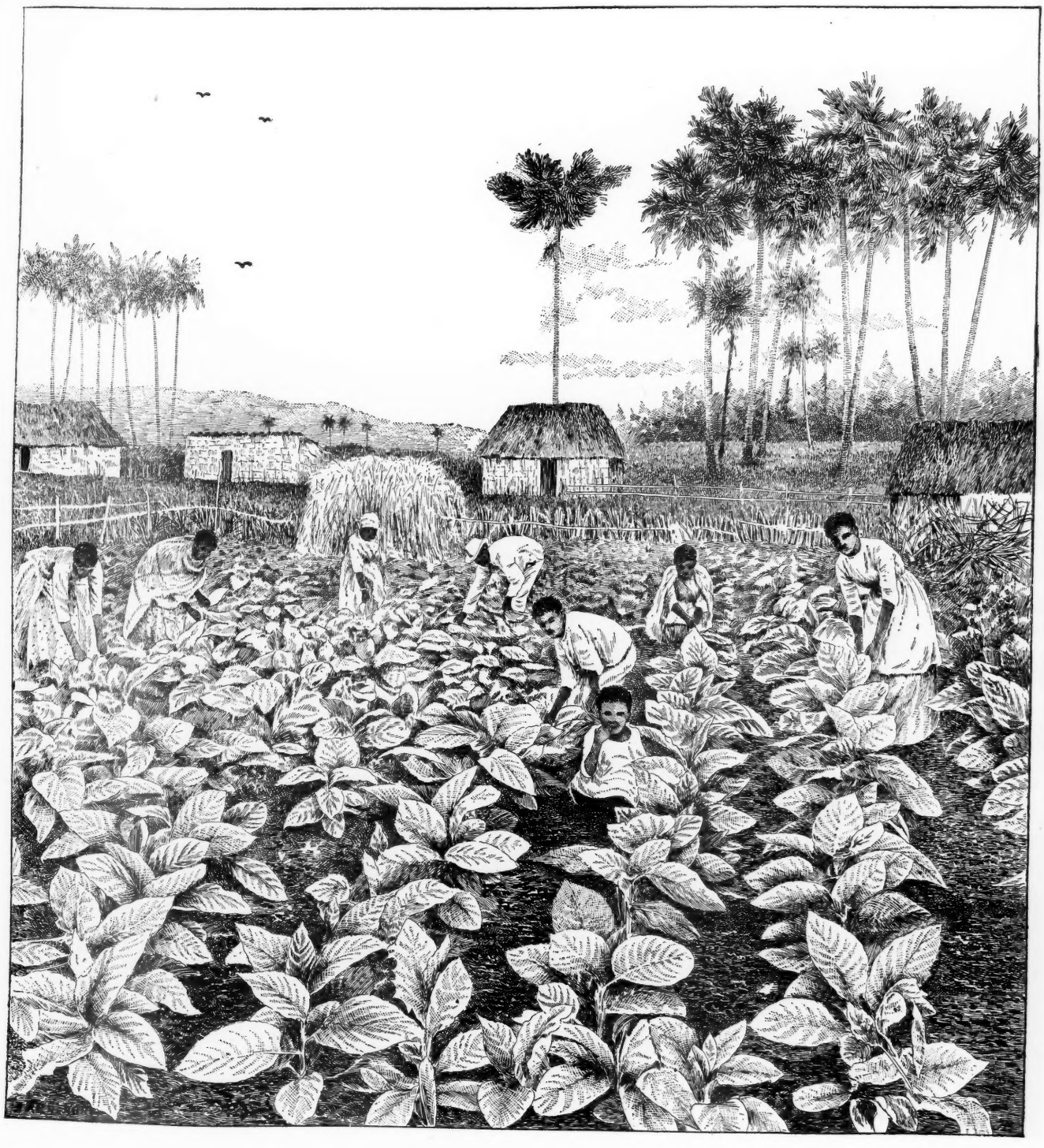

A CUBAN TOBACCO PLANTATION.

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TOBACCO IN TROPICAL AMERICA.

I. N. FORD.

ALTHOUGH tobacco was the first agricultural industry introduced by Europeans in the New World, it is now confined to small areas of tropical America. The plant was cultivated by the natives of the West Indies, Brazil, Mexico, and North America before the voyages of Columbus. Its name is derived from the Indian term used by the natives of Santo Domingo for the pipe in which the leaves were smoked. It was almost the first gift of the New to the Old World, and so heartily was it appreciated that the earliest settlers in the West Indies were tobacco planters. In Brazil it took precedence of both sugar and coffee in the order of agricultural development. The Dutch, who were the great rivals of the Portuguese in both the East and West Indies, began at Surinam by raising tobacco, and were followed by the Spaniards at Cartagena. The French in Martinique and other islands, the English in Barbados, the Leeward islands and the Bahamas, and the Spanish in the four greater Antilles, regarded it at the outset of their colonial experiences as the chief agricultural resource, but speedily abandoned it for coffee and sugar. The cultivation of tobacco has steadily declined in tropical America, until it is now exported from only three countries, the Spanish West Indies, Brazil, and Mexico, and not in large quantity from the last two republics.

There was an agrarian cause for the disappearance of what was once the common industry of a large part of the tropical belt. The effect of slavery in both hemispheres was to prevent diversification of products. Each slave-holding population had its simple industry. The West Indies became first coffee, and then sugar islands. Brazil began with tobacco, sugar, and cotton, and ended with coffee. The Southern States in the northern hemisphere were converted into the world's great cotton belt, and the Border States into the most profitable tobacco region of the continent. Slavery was abolished, but the economic effects remained in the concentration of agricultural resources. Cuba, owing to the remarkable adaptability of its soil and climate for the cultivation of both sugar and tobacco, had two baskets for its eggs. Brazil and Mexico slowly developed an industry capable of supplying the home market with cigars, and of filling moderate export orders from Germany. The remaining countries were content either with raising small crops of inferior tobacco for the impoverished natives, or with importing their supplies from Cuba and the United States.

An exception to the rule is to be noted in the case of Paraguay, the smallest and most unfortunate of the South American States. During the period of industrial revival which has followed its disastrous war with three neighboring States, it has been producing tobacco with marked success. A Dutch company has made a series of experiments with Havana, Manilla, and Sumatra seed, and has found the soil to be favorable for the cultivation of tobacco of fine grades. The bulk of the produce is coarse, and resembles the Bahia product; but there has been a marked improvement during the last ten years, both in the quality of the leaf and in the methods of cutting and drying. The plants are set out in September, transplanted in November, and ready for cutting in January. Paraguay has so small a working population that it cannot do more than to supply the Argentine and Uruguay with a portion of their smoking stock. Its exports do not exceed $1,000,000, but are steadily increasing. Tobacco can be produced in the two lower Platte countries as easily as in the Border States of the American Union, but the industry has not been undertaken with spirit and agricultural knowledge.

In Brazil there is a large territory available for the successful cultivation of tobacco. The cigar factories are in Bahia, and the plantations are mainly in the adjacent districts. The leaf is dark colored and oily, and is lacking in flavor, but burns freely. When kept until they are fairly dry, Bahia cigars lose their coarse qualities, and are equal to the ordinary product of Cuba. A race that requires strong coffee has a taste for equally rank tobacco, and, as the foreign demand is from portions of the European continent where dark leaf is preferred, there has been little encouragement for an improvement of stock. The export amounted, in 1889, to $7,000,000, Germany taking six-sevenths of the surplus, and France and Belgium the remnant. Fertilizers are sparingly used in cultivation, and the whole plant is ordinarily cured and dried without separate cutting and assorting of the leaves. The resinous matter, which is characteristic of the stock, is not killed off in the process of curing, and taints the flavor. There is probably no other agricultural industry of the first rank in Brazil which suffers as great injury from the lack of scientific farming and an efficient force of manufacturing hands. There are no coolies in Bahia to compete with those in Havana. The factory work is not done with intelligence and skill, and the quality of the product is impaired by crude methods of manufacture. It is the leaf which is exported from Brazil to Germany, and it is manufactured there on a very large scale.

The export of Mexican leaf and cigars is small in comparison with shipments from Brazil and Cuba, not exceeding $500,000 in 1888. The industry was revived during the Cuban insurrection, when refugees from the island settled in the highlands, near Vera Cruz. There are now in that city six or eight large factories, employing two thousand workmen, and there are similar establishments in the city of Mexico, San Luis Potosi, Jalapa, Pueblo, and other cities. The trade is controlled by Germans, and the product has been steadily improving during the last decade. The factory work is well done, and cigars of every quality and shade of color can now be bought in Mexico, ranging in price from two to twenty dollars a hundred. So excellent are the best brands of Mexican cigars, that it is remarkable that the export trade in leaf has not been more largely developed. The reason assigned by planters is the carelessness which has prevailed in assorting and packing leaf. With improved methods of classification, Germany is already increasing its orders, and showing a less decided preference for the Bahia leaf. The best Mexican tobacco is raised in Tabasco and along the border of the States of Vera Cruz and Oaxaca. The upland leaf of Orizaba and Cordova is inferior in quality to the lowland product.

Mexican tobacco plantations lie along the banks of rivers where the atmosphere is humid and irrigation practicable in dry seasons. The seed is scattered when the ground is moist, and the sprouts are seen ten days after planting. When the fields have been plowed and trenched the process of transplanting follows in cloudy weather, an iron planter being used in making holes on the side of the furrow. When the plants are twelve or fourteen inches high, two or three of the lower leaves are cut off and the soil is drawn closely about the stem. At a later period the tops are cut off to prevent flowering. The leaves are cut at maturity, on clear days, and the plants are watered and cultivated afresh for a later harvest. The leaves are first spread out in the sun, and are then strung together and hung up in drying-houses. In order to secure uniformity of color the leaves are then separated and allowed to dry slowly, care being taken to secure adequate ventilation, and to prevent undue fermentation. The curing process is one of great delicacy, and the Mexican population has the resources of patience and keen observation required for conducting it successfully. In Central America tobacco is ruined in the drying, and such cigars as are made there are irretrievably bad. In Costa Rica the business is a government monopoly, and the product cannot be enlarged by private enterprise. Colombia sends to Germany less than $1,000,000 in leaf inferior to the Mexican.

The shipments of tobacco from the Spanish West Indies during 1889, included $11,000,000 to the United States, $3,000,000 to Germany, $1,500,000 to Spain, $775,000 to France, and small amounts to England and other countries. The exports of tobacco from the United States during the same period were nearly $22,000,000, although it offered a market for $11,000,000 of the $17,000,000 of Cuban product. The district where the choicest leaf is raised in Cuba is one of small area—the famous Vuelta de Abajo, at the western end of the island. It is surrounded by belts, in which leaf of excellent color, but deficient in delicacy of aroma is produced. It is soil, rather than climate, that regulates the quality of tobacco, and it is only within the narrow compass of this single district that the conditions for the finest grades of leaf are supplied. Even there the choicest quality cannot be obtained unless the lower leaves are trimmed, so that the full strength of the plant will go into the upper leaves that are fully exposed to sunlight. The reputation of the best Havana brands has been dependent upon the resources of the highly-favored Vuelta de Abajo, and the painstaking care with which the critical operation of pruning was performed. With an increasing demand for the finest qualities, planters have disliked to waste the lower leaves, and manufacturers

have drawn upon outlying districts, where leaf of good color can be obtained. Much of the tobacco raised near Cienfuegos, and at the eastern end of Cuba, is now shipped to Havana, and made up into cigars passing under the best names. The deterioration in the quality of Cuban cigars, during recent years, is largely to be explained by the artificial widening of the Vuelta de Abajo, so as to include various hot tobaccos similar in color, but markedly inferior in aroma.

In the best plantations the plants are carefully selected when transplanted, and the leaves are cut off separately and assorted. In the new districts near Cienfuegos and Santiago there is no choice of stock, and the entire plant is plucked up at maturity and taken to the drying-ground, and suspended from horizontal poles for a month. After remaining for several days in unventilated rooms, and artificially moistened with a preparation of stem-juice for the sake of inducing a second fermentation and imparting uniformity of color, the stalks are stripped of leaves and these are bunched for careful assortment in the factories. This crude method of curing impairs the quality, but is economical, and brings into market a large quantity of cheap tobacco. The ordinary methods of cultivation are followed in Cuba, guano being extensively used to supply the defects of an overworked soil. November is the sowing season, transplanting ensues late in December. The harvesting begins by the middle of March and lasts about thirty days. All the enemies of the plant are found in the island, and have to be fought, hand over hand. The tobacco worm, the mariposa and a slug are the chief pests, and the utmost vigilance is required in order to prevent the destruction of the plant. The plantation work is done by blacks, but the main factory processes are conducted most intelligently by Cubans and Coolies. The Havana factories are well equipped with machinery, and in every department are systematically organized. In the busy seasons thousands of men, women and children are employed in the various processes of selecting wrappers, making cigars by hand, attaching paper labels and trademarks, sorting cigars, and manufacturing cigarettes.

The same process of centralizing labor which has been introduced in the cane sugar industry is in operation in the tobacco trade of Cuba. As the business of milling sugar is passing into the hands of a small number of large factory owners, and cane is raised by planters, and sold to the works from which advances for the season's expenses have been received, so is it also with the tobacco product. Small planters make arrangements with buyers before the seeding, and agree to take a certain price for every plant, according to its size and quality. The system is one which induces the production of large crops of inferior grades of tobacco. Deterioration of quality, and increase of quantity are the leading characteristics of the Cuban trade. The planters are banking, to a large degree, upon the former reputation of their tobacco, and are adding to the volume of their product by cheapening it. In the British West Indies, where tobacco of high grades can be raised with signal success, the industry is not making progress. Jamaica cigars are superior in flavor and quality to any but the choicest Havana brands, but the export is not increasing. The Spanish are displaying more energy than the English in the West Indies, both in the tobacco and the sugar industries.

How to Manage a Manure Heap.—W. H. E., Bloomington, Ill., desires information as to the best method of treating stable manure, and whether throwing water on it to keep it from "fire-fanging," wastes the manure. Not unless the water runs away. If the water soaks through the heap and descends into the ground, or runs off into the nearest stream it will carry off some of the soluble matter of the manure. But it is not likely that too much water is thrown on; it takes a great quantity of water to saturate and keep saturated a heap of stable manure. The heat generated evaporates a great deal of water. Cow and pig manure are less liable to heat than stable manure, and it is a good plan to make a pile consisting of alternated layers of these three manures; or, if there is nothing but stable manure, some weeds, or sods, or clayey soil, should be mixed with it. Pure sand will not answer. At any rate it is known that clay mixed with liquid manure will check decomposition, while sand increases it. As a rule sods, either fresh, or more or less decomposed, are the best things to mix with stable manure. Put a layer of manure at the bottom a foot thick, and then six inches of sods, and then six inches of manure, and six inches of sod on top of it, and so on till the heap is five feet high. It is usual to make the pile five or six feet wide. There is no danger of such a pile "fire-fanging." It should be made out of doors. It is a rare thing to have rain enough to more than saturate it. And there can be no loss unless the water that falls on the pile leaches through it and runs away. Such a compost is valuable not merely for the plant food that it contains but for the bacteria or nitrification germs or "yeast" which will grow in it and which when, spread on the land will, in favorable conditions, cause nitrification and other desirable changes in the plant food of the soil.

FIFTY YEARS PROGRESS IN INDIAN CORN CULTURE AND USE.

C. S. PLUMB, INDIANA AGRICULTURAL EXPERIMENT STATION.

While there is ample evidence to show that Indian corn is indigenous to America, and that it was not known by Europeans prior to the discovery by Karlsefne, an Islandic voyager, in 1006, or by Columbus in 1493, ethnological research, if nothing more, demonstrates that maize has been subjected to various uses for many centuries by the aborigines of the American continents. The Indians used it for food, from it they prepared a pleasing drink, and in some instances worshipped it. Champlain, in 1605, describes the methods the Indians had of storing maize in large grass sacks, burying it under ground in dry places. This same traveler in 1615 found the Iroquois Indians gathering their maize harvest in New York. During the past half century, the maize plant has felt the general progress of civilization, through the influence of man, in the following directions: 1. In variation. 2. In adaptation to economic uses. 3. Methods of cultivation. 4. Application of improved implements. 5. Geographical distribution.

VARIATION.

Maize is extremely susceptible to the influences of cultivation; environment, cross-fertilization, etc., consequently this plant exists in greater variation than ever before. Early history records but few varieties. The Indians of the Southwest probably grew very much the same type of large-eared, very starchy soft corn that they grow to-day. The natives of Peru and other South American countries, it is known, grew a small-eared dent variety, as this has been found in mummy wrappings and graves. In the cooler parts of North America, the smaller eared flint varieties, only, were grown, until about 1779, when historical record is first made of sweet or sugar corn.

About 1841 a number of varieties seemed to attract attention; Chinese Tea corn, a white variety, was advertised. For many years King Phillip flint had been grown in New England, and from 1838 Dutton corn became popular. About 1822 Stowell's Evergreen was sold by Thorburn, of New York, and has been very popular ever since. Virginia White Gourd Seed and a large Yellow Dent were also favorites in the warmer parts of the country. In 1848 Salisbury, in the transactions of the New York Agricultural Society, mentions three varieties of sweet corn, viz.: Small Early Sweet, Large Rhode Island Sweet, and Hematite. In 1851, in Virginia, the most esteemed varieties of corn were Gourd Seed, Large White, Large Yellow or Nansemond. Pearl pop corn was sold about this time also. In Northern Indiana the two principal varieties grown were a white and a yellow. In Ohio, a large, yellow, fourteen rowed variety was most esteemed. Striking differentiation in varieties occurred coincident with the increase of seed dealers and the settlement of new lands in North America. The earliest settlers referred to their corn as a rule, by color, size, or rows of kernels. From many of these old settlers, however, have come varieties of certain character, which they state they "have grown for thirty years without being mixed." Isolation has given opportunity to fix the character of a variety by means of careful selection. Within the past thirty years, the greatest increase in varieties has come. In 1860, Klippart gave a list of sixty-nine varieties of corn representing dent, flint, sweet, pop, husk, and soft races. Of the varieties described, Early Adams, Tuscarora, Stowell's, Mammoth Sugar, Gourd Seed, Rice, Canada, Dutton, King Phillip, Red Pop, Yellow Pop, Calico, and Hominy are well known at the present day. In 1866, Enfield in his work on Indian corn, states that varieties of maize are chiefly distinguished by reason of the color, number of rows on the cob, size of grain, form and hardness of grain, color and size of cob, length of time in maturing, etc. Of yellow varieties this author enumerates ten, of white eight, of sweet six, and ten others that are valuable; these are all leading varieties. By 1880, the number of names of so-called varieties of corn on the market was legion. At the New York Experiment Station, at Geneva, Dr. E. L. Sturtevant gathered together a collection supposed to represent three hundred different varieties, and in the report of that Station for 1884, he gives accurate descriptions of

thirty-three varieties of sweet corn, forty-four of flint varieties, forty-seven of dent, twelve of soft, and ten of pop, a total of one hundred and forty-six varieties, supposed to be distinct. No doubt five hundred different names could be found that have been applied to so-called varieties of Indian corn, of which the large majority have been given within the last score of years.

ADAPTATION TO ECONOMIC USES.

Indian corn and its products are extensively used as food for man and beast. The grain has been roasted, or used in making succotash for centuries. The first uses of the grain among the early settlers was for making hasty pudding, corn or pone bread, gruel, and hominy. As civilization advanced, and the wants of humankind grew more artificial, cooks originated by degrees other methods of preparing the products of the grain for the table. So variable have become these methods that C. J. Murphy has published in pamphlet form a list of one hundred and thirty different formulas for preparing and cooking the products of this grain. Perhaps the greatest move to disseminate knowledge concerning the uses that maize can be put to for food, has been made by Mr. Murphy. For the past five years he has been laboring in European capitals, trying to teach the people to use Indian corn for human consumption. About a year ago Secretary Rusk appointed Mr. Murphy a special agent to represent the United States Department of Agriculture abroad, to disseminate information on the value of maize as a food. Great success is now attending Mr. Murphy's efforts, and already the German government is introducing corn as a human food in the army of that country. Since chemistry has come to play an important part in manufacturing industries, we find maize, or its by-products becoming of more and more value. A large share of the starch made is a product from corn. The same may be said of whiskey and alcohol. A kind of molasses and an inferior sugar are made from corn. Several years ago a St. Louis firm established the business of expressing oil from Indian corn. From a bushel of the grain, it is said, a gallon of clear amber oil is obtained. Within a few years manufacturing firms have begun to place upon the market Indian corn preparations sold under a variety of names and conditions, as cerealine, a delicate white chip; samp, a beautiful form of hominy; crystal rice, reminding one of pop-corn; hominy grits, corn finely cracked, etc.

Since the establishment of the AMERICAN AGRICULTURIST, one of the most important methods of preparing corn for domestic animals has come into general use, viz.: that of ensilage. It is only a few years since, in the corn growing belt of the United States, that corn fodder has been saved at all, though now vast quantities are cut, stacked and fed. Now, by means of placing in silos, a large quantity of succulent corn may be preserved at small expense and fed to live stock during the winter months.

CULTIVATION.

The methods of cultivation have been changed greatly since 1860. The fields are more thoroughly cultivated. Hilling is no longer practiced by progressive farmers. In the West, listing is now receiving attention. After much research, feeding experiments and chemical analyses have seemed to demonstrate that the old custom of growing corn fodder thickly broadcast or in close rows is not the best, but that kernels dropped a foot apart in drills, three and a half or four feet apart, produce the best fodder. Further, instead of cutting the fodder when the ear is just forming, it is now cut just in the glazing stage, especially if for silage. For ten years, or so, root pruning of corn was advocated, but the mass of evidence at hand to-day indicates the desirability of shallow cultivation between the rows, for where the roots are mutilated the crop is diminished as a result.

IMPROVED IMPLEMENTS.

The invention of new implements has played an important part in the handling of the corn crop. By means of the gang plow, improved harrows, cultivators, planters, and drills, five acres may be planted to-day where but one could be handled in 1842. Twenty-five years ago gang plows and self-seeding drills were not employed in American corn culture. To-day, were it not for these tools, the vast corn fields of Indiana, Illinois, Missouri, Kansas, and Nebraska would be enormously reduced. Had not the improvements of the past twenty years been made in agricultural machinery, we should not now be able to supply our own demands for Indian corn. The corn drill is a comparatively recent invention. A corn husker is not yet a success. The corn harvester is a new invention, a machine modeled after the reaper, which, in future, must largely assist in handling the fodder. The old-fashioned, vertical, knife fodder-cutter, worked by a lever, has given way to the modern cutter, propelled by arm and drive wheel, or by steam, which accomplishes wonders compared with the machine of yore. Could we follow step by step the improvements of fifty years in handling and harvesting maize, we should find it to be a wonderful progression, a great conserving of strength, a striking illustration of the developments of Yankee ingenuity in agricultural economy.

GEOGRAPHICAL DISTRIBUTION.

The geographical distribution of Indian corn has undergone a change to a certain degree during the past half century. Considering the relative positions held by the ten great corn growing States we find them as follows. It is to be noted that the growth of population has materially influenced the relative standing and, consequently, the geographical location of the largest corn growing States:

	1849	1859	1869	1879	1889
1.	Ohio,	Illinois,	Illinois,	Illinois,	Iowa,
2.	Kentucky,	Ohio,	Iowa,	Iowa,	Illinois,
3.	Illinois,	Missouri,	Ohio,	Missouri,	Missouri,
4.	Indiana,	Indiana,	Missouri,	Indiana,	Indiana,
5.	Tennesee,	Kentucky,	Indiana,	Ohio,	Tennessee,
6.	Missouri,	Tennessee,	Kentucky,	Kansas,	Ohio,
7.	Virginia,	Iowa,	Tennessee,	Nebraska,	Texas,
8.	Georgia,	Virginia,	Pennsylv'nia,	Kentucky,	Kentucky,
9.	Alabama,	Alabama,	Texas,	Tennessee,	Nebraska,
10.	N. Carolina,	Georgia,	N. Carolina,	Pennsylv'nia,	Kansas,

After 1859 Virginia and Alabama are dropped from the list, and Tennessee, which stood fifth in 1849, drops to the ninth place in 1879, but comes back again to the fifth place in 1889. While Ohio was first in the beginning, she stands sixth in 1889.

America is the home of the corn plant, and it thrives in perfection along the line of Illinois, Indiana, Iowa and Nebraska. A hardier, quicker growing plant must be grown north of these States, where the season is short, frosts occurring late in the spring and early in the fall. The development of new, quick-growing varieties has made the possibilities of corn-growing in these more Northern States greater at the present than at any other time in their history.

In conclusion, through the sequence of progress, maize is grown in greater variety; is used as food more extensively and variably; is grown and harvested more economically at the present than at any other time in the history of the plant.

THE FARMERS' CLUB.

Every town should have a farmers' club! Every farmer should attend it faithfully. A well conducted schoolhouse club stands next to the agricultural paper as a means of disseminating useful knowledge among the farmers. The club can deal with the local issues of the particular section where it is held, while the paper must needs be more or less cosmopolitan. It is a simple matter to have a club. A few good, earnest, active members are all that is needed. There is very little need of a lengthy constitution, or of wasting time over obscure points of order. There needs to be a chairman, who shall preside at the meetings, and a secretary to give the required notices of the gatherings. Long papers, as a rule, are not desirable, but if every one will go prepared to bring forward a single subject, the programme will be full, and the meeting an interesting one. Occasionally some one from another club may be invited to speak at some length, and it is a poor meeting that will let him sit down with all his ideas unchallenged. The club should be attended by the whole family, and not simply by the men folks. The women are as able as any to make the evening interesting, and often more so.

Care of Milk in Cold Weather.—When the weather is cold enough to keep the thermometer below fifty degrees during the day, there will be no need for a fire in the dairy room or a box to keep the milk in if deep cans are used. Select a corner in a clean room, use cans made eight inches in diameter and eighteen inches deep with close fitting covers. Set them all in the corner of the room, putting the fresh ones with warm milk in them a little way from the others when the weather is not very cold. But in zero weather cover the cans at night with one or two blankets, so that the milk will not freeze. If one has never tried the deep, cold method of setting milk this will be an excellent and economical way of making the experiment. The cans can be bought of any dealer in dairy implements along with the necessary dipper. In skimming, remember you must take off nearly, if not quite, one-third of the contents of the can before you get down to the skim milk. Keep dipping until you come to it. You can easily tell it from the rest.

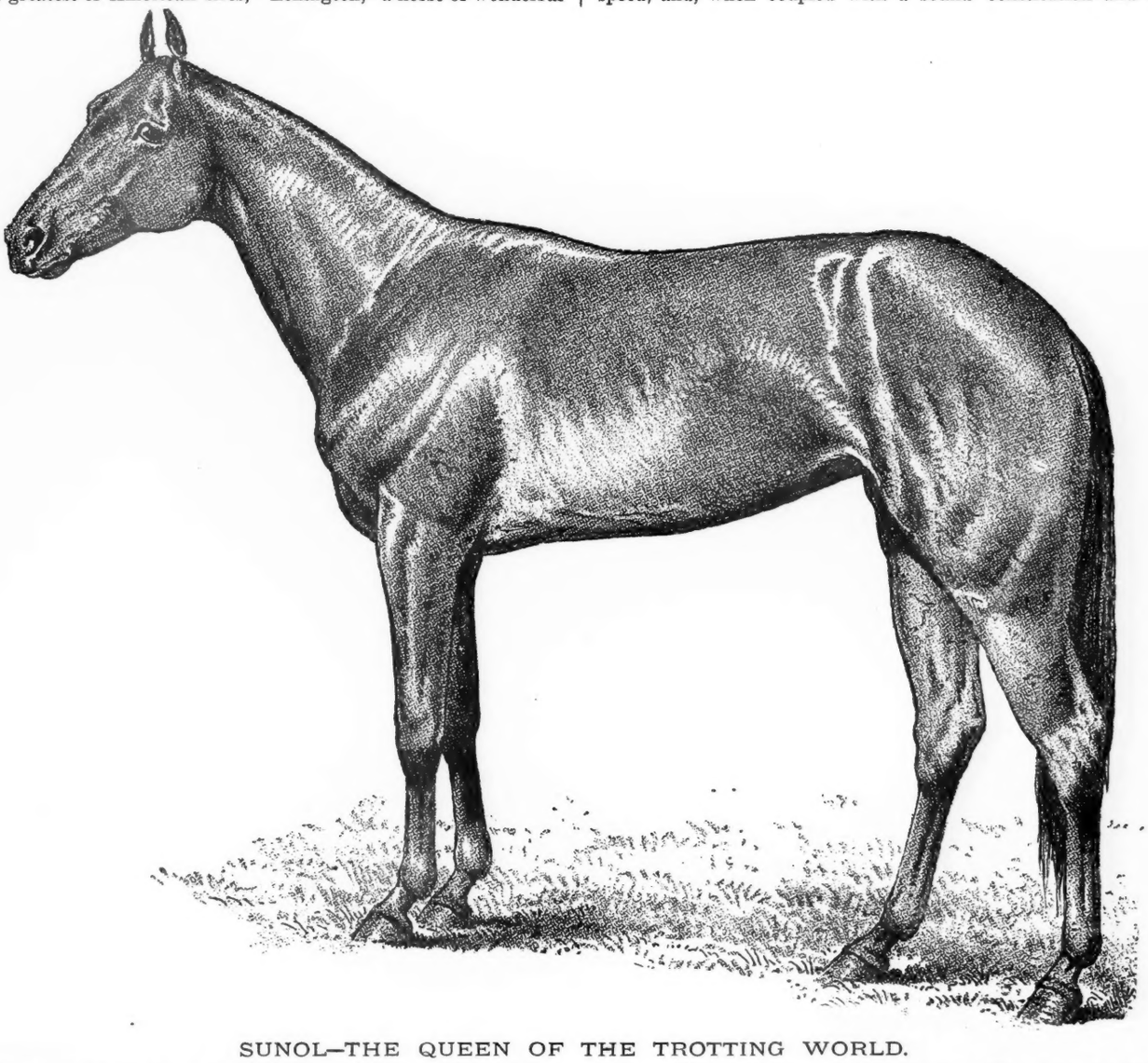
THE STAR OF THE HOUR—SUNOL.

MIDY MORGAN.

The subject of this article, Sunol, is a bay mare, foaled April 14, 1886. She was bred by Hon. Leland Stanford at his ranch of Palo Alto, in California. She now stands the queen of the trotting world, having trotted over the Stockton track in San Joaquin Co., California, one mile in 2.08¼. This is one-half of a second better than Maud S. made her mile, which took the chestnut mare 2.08¾. That Sunol's performance was greater, I am not prepared to maintain, as it was made over a kite-shaped track; Maud S. made her mile over an older fashioned race track. Sunol is the daughter of Electioneer, from Waxana, who was by General Benton [1755]. Waxana is a chestnut mare from Waxy, who was by our greatest of American sires, "Lexington," a horse of wonderful merit, from whom descended race horses and trotters. Waxy was also the dam of the great brood mare, Alpha. The value of the Lexington cross is, if possible, established more absolutely by the further fact that he was also the sire of the dams of Ansel, time 2.20; Nora Temple, time 2.27¼; Temple and Lady Prewett, both with records of 2.30.

Electioneer, the sire of Sunol, was by Rysdyk's Hambletonian [10], his dam, the famous Green Mountain Maid. He was a dark bay with both hind feet white, stood fifteen hands, two and one-half inches, was foaled May 2, 1868, and died December 3, 1890. Mr. Charles Backman, of Stony Ford, Orange Co., N. Y., bred Electioneer, and owned Green Mountain Maid when she died. So great was his regret at her loss that he had a monument erected at Stony Ford to her memory, the inscription on which styles her: "The great dam of trotters and producers of trotters." The monument was dedicated January 11, 1890, in the presence of a distinguished party of Mr. Backman's friends. Green Mountain Maid was foaled in 1862, and died in 1888. With the decease of so many of her illustrious ancestors, the strains of blood united in Sunol render her, independent of her great speed, which has won for her universal admiration, a most valuable animal as a brood mare; and it is mainly from the breeder's point of view that this remarkable animal possesses interest for the greater number of readers of the AMERICAN AGRICULTURIST.

On Thursday, December 10, 1891, Sunol reached the stable of her present owner, Mr. Robert Bonner, of New York, where she occupies the stall vacated by her predecessor, Maud S. Sunol stands at the withers sixteen hands, one-half inch, and at the junction of the dorsal and lumbar vertebræ sixteen hands, two and one-half inches. This is the conformation which insures great speed, and, when coupled with a sound constitution and even temper, we have in the union of these qualities a most valuable animal who only needs muscular development and careful training to become what Sunol is—a magnificent specimen of a glorious race.



SUNOL—THE QUEEN OF THE TROTTING WORLD.

THE ADVANTAGES OF BITTING.

E. C. POWELL, MASSACHUSETTS.

Where bitting is done properly it has many advantages, while the improper use of the bitting machine often leads to serious consequences. Many horsemen believe that if a colt has no style born in him he never will acquire it. However true this may be, it is possible, with the bitting machine, to greatly improve the style that a colt naturally possesses. Besides, it teaches him restraint that he would not learn otherwise. The machine consists of a bridle checkrein, girth, crupper, and two side straps. Use a common straight bit, and, preferably, a side check, fastened high up on

the bridle. The back pad of an old harness is good if the terrets and check-ring are taken out, so the colt can roll over if he throws himself. Put the back piece or girth on, and buckle it tight; fasten the check to it, and bring the colt's head up where he carries it naturally. The side straps are fastened about half way down on each side of the girth, and the loose ends buckled into the bit rings. These are to prevent the colt from turning his head to either side, and should be light enough for this, but not to pull his nose in, much. Put this on him every day for an hour, and turn him in a paddock, or loose box. Gradually take up the checkrein until his head is brought where it is wanted. It may take two or three months. If the training is pushed too fast, or the check is taken up too much at one time, or the machine is left on too long, it may do irreparable harm. When done thoroughly this strengthens the muscles of the neck so the colt will always carry his head up. It will also help to improve his knee action.

PROGRESS OF A HALF CENTURY IN DRAINING.

DR. MANLY MILES.

Nearly all that is known in regard to the principles of farm drainage and the present improved methods of practice, have been developed within the past half century. The foundation for a consistent system of farm drainage was, in fact, laid but a few years earlier, by Mr. James Smith, of Deanston, Scotland, in his papers published in 1833 and 1836, in which he recommends the thorough draining of high land, as practiced on his farm of two hundred acres, by what he called the "Frequent Drain System," which provides "frequent opportunities for the water rising from below, or falling on the surface to pass freely and completely off," and leave the land in a favorable condition for growing crops. Previous to that time, so far as published records are concerned, attention had been exclusively directed to the removal of standing water from swamps and low grounds, and the experience of the few individuals, in advance of the age in which they lived, who had attempted to ameliorate retentive upland soils by thorough drainage, had not been noticed by writers on agriculture.

As "Smith of Deanston" was the first writer to urge the importance of draining high lands, his reasons for the practice are of particular interest. He says, "the portion of land wetted by water, springing from below, bears but a very small proportion to that which is in a wet state from the retention of the water which falls upon the surface in the state of rain, and a vast extent of the arable land of Scotland and England, generally esteemed dry, is yet so far injured by the tardy and imperfect escape of the water, especially in winter, and during long periods of wet weather in spring and summer, that the working of the land is often difficult and precarious, and its fertility much below what would uniformly exist under a state of thorough dryness. A system of drainage, therefore, generally applicable, and effecting complete and uniform dryness, is of the utmost importance to the agricultural interests, and through them to all the interests of the country."

The next important step in the direction of real progress, was made less than fifty years ago, by Mr. Josiah Parkes, consulting engineer of the Royal Agricultural Society, who made several improvements on the Smith of Deanston system, and applied the known facts of science in developing a rational philosophy of farm drainage, in his papers published in the Journal of the Society from 1843 to 1846. He demonstrated the economy of deeper drains at wider intervals than had before been thought necessary, and urged the advantages of round pipe tiles, over the stones and horseshoe, and sole tiles, that had previously been used. It had been thought necessary to cover tiles with several inches in depth, of small stones and gravel, or other porous material, to secure the free access of water to the drains, but Mr. Parkes showed that this involved needless expense, and that tiles with clay, packed in immediate contact with them, acted quite as efficiently by admitting water through their joints from below. He made a thorough examination of the relations of drainage to rainfall from experimental data, and conducted experiments on the influence of drainage in warming the soil, and his intelligent discussion of principles in connection with practical details, served to awaken a general interest in the advantages of farm drainage. Mr. Henry Stephens, in his *Book of the Farm*, published in 1844, gave an extended chapter on draining which was enlarged and issued in a separate form in 1848 under the title of *a Manual of Practical Draining*. This was generally accepted as an authority on the subject, and his directions for draining were closely followed by subsequent writers notwithstanding the better method developed by Mr. Parkes, which was entirely ignored. For this reason the improved system of draining advocated by Mr. Parkes, was not widely adopted, and real progress was retarded by a repetition of false theories and imperfect methods of construction.

Mr. John Johnston, of Geneva, N. Y. is entitled to the credit of making the first practical demonstration of the advantages of draining high lands in this country. As early as 1835, only two years after the appearance of the first paper on draining by Smith of Deanston, he imported sample tiles from Scotland, and made tiles by hand with which he thoroughly drained his farm. The beneficial results of his extended experience were so obvious that others soon followed his example, and the AMERICAN AGRICULTURIST at that time published several interesting articles on draining, in which the experience of a number of individuals was recorded. The tiles used were of the old horseshoe form, followed soon afterward by the flat-soled tiles, but from their inherent defects they have been gradually superseded by round pipe tiles, which are now generally admitted to be the best and only perfect form for successful drainage. In 1859 *Farm Drainage*, by Henry F. French, was published, and Waring's *Drainage for Profit and Health* made its appearance in 1867. These timely works of real merit have been the standard authorities on draining in this country to the present time. On the whole, they indicate a decided improvement in methods of draining since the publication of Stephens's book, but they follow him in directing the tile-laying to begin at the upper end of the drain, and in several minor details the influence of the same authority is apparent.

During the first half of the fifty years under consideration, drainage held a prominent place among the means of increasing the fertility of soils, but for the past fifteen or twenty years the attention of farmers has been directed to purchased supplies of plant food, as the most important consideration in improved farming, and there has been a tendency to overlook the fundamental law in agriculture, that manures cannot produce the best results on undrained, retentive soils. There is, in fact, no book on draining, at the present time, in which the best modern practice is described, or the principles of drainage are fully discussed from the standpoint of the latest developments of science. Progress in draining methods has however been made, but the best practice has been confined to comparatively limited localities where trained workmen and superintendence could be obtained.

An important improvement in the methods of laying tiles was made at the Michigan Agricultural College, an outline of which was published in the Report of the State Board of Agriculture for 1873. From the frequent pockets of quicksand within four feet of the surface on the College farm, in connection with the slight fall that in most cases could be obtained, it was found to be impracticable to begin laying tiles at the upper end of the drain, as advised by the authorities on draining, and the reverse process of beginning at the outlet to lay tiles was adopted with the most satisfactory results. Experience soon proved this to be the best and most economical method under all conditions, as in addition to the saving in labor, greater accuracy was secured in the grade of the drain, and the work of tile-laying was carried on as fast as the excavation was made, and long lines of ditches were not kept open for some time before the process of laying the tiles could be started. In connection with this change of base, a simple method of adjusting a line above the ditch, to serve as a guide to the grade, and an improved form of draining-scoop which could be conveniently used for making a groove for the tiles in the bottom of the ditch, obviated most of the difficulties usually encountered in making tile drains. This system of tile-laying has been followed with the best results in extended draining operations, and its advantage over former methods has been fully demonstrated.

As competition in farm products increases, thorough drainage must be recognized as of the first importance, among the means of increasing fertility and securing uniformly remunerative returns in growing crops, and improvements in the construction of farm drains, to secure the strictest economy in every detail, in connection with permanency and efficiency, must be of interest to every intelligent farmer.

Good Use for Winter Evenings.—The present long winter evenings are designed for the making of good plans for the future season's work. Draw up a scheme of operations, consider it well, and then subscribe your name to the resolution that success is to those who are willing to pay the price, and the price is patient execution of a well-digested plan.

AMERICAN SEED GROWING.

W. W. TRACY, MICHIGAN.

There is no branch of American agriculture which has, in recent years, developed more rapidly, both as to extent and methods, than seed growing. American seedsmen have so energetically and successfully attracted attention to the goods they have to offer, and made it so easy for people to obtain them, that thousands, who formerly grew and saved their own seeds, now depend wholly upon the seedsmen; and thus the commercial consumption of seeds has increased much more rapidly than the mere growth of the country would warrant, and is now much greater than most people imagine.

To realize its magnitude it is only necessary to state that last season a single firm contracted for the product of about thirteen thousand acres of garden seeds. It would be quite impracticable, even if it were desirable, to attempt to grow all these seeds on one, or even a dozen farms, and, so, seedsmen have generally adopted the contract system. They first ascertain some place where the soil, climate and other conditions are especially favorable for the best development of some particular class of seeds, and then enter into contracts with farmers living there to grow for them such quantities as they may need. Thus, the valley of the Platt river, in Nebraska, seems particularly favorable for the growing of vine seeds, and, last season, a single firm contracted for the growing in this valley of nearly twelve hundred acres of cucumbers for seed. Jefferson Co., New York, produces an exceptionally good quality of seed peas and beans, and not far from three hundred carloads of garden peas and beans are annually shipped from this vicinity. With the increase of the acreage planted there have come better and more economical methods of cultivation and preparation for market, involving the use of specially adapted cultivators, and also machines for separating and cleaning the seed, some of which are marvels of simplicity and efficiency. By the use of some of these contrivances the seed can be separated from the fruit product of five acres of cucumbers in a day. With other equally efficient arrangements for washing and drying, a man of experience, having the control of a one hundred and sixty acre farm, and with labor no more available than it is in ordinary farming districts, can, without special anxiety, grow ten to twenty thousand pounds of cucumber, or other vine seeds.

FIG. 1. VIEW OF TRIAL GROUNDS.

The fertile soils and high freight rates have been a constant incentive to western farmers to undertake seed growing, and every such attempt has been met with the claim that western grown seeds are inferior to those grown on the older farms of the East. At first there was often good ground for such claims, but as the western growers gained in experience and took more pains with their stock seed there has been great improvement, until Michigan-grown onion seed ranks, to say the least, fully equal to the best from Connecticut. Puget Sound cabbage seed compares favorably with that from Long Island, and California lettuce seed has practically driven all others out of the market. Not only American, but European seedsmen depend upon it for their supply, and there seems no reason why the cheap and fertile lands of the West may not, by the use of proper care in the selection of stock seed, and in cultivating and caring for the crop, produce garden seed for the world as fully as they now furnish its meat and wheat. But the conditions described have resulted in such eagerness on the part of farmers, living in districts adapted to seed growing, to enter into contracts for seed crops, that competition has lessened the price paid the grower. In many cases it is now so low as to make a crop of seed scarcely more profitable than one of field corn, and, in the future, only men of experience and in the most favorable locations can make seed-growing pay.

With the widening of the sources of supply, has come the necessity of seedsmen having trial and test grounds, where samples of the crops, grown by contract, can be tested as to vitality, purity, and other qualities as well. Now all the larger dealers have such grounds, where they not only test samples of crops grown for them, but make a careful study of varieties and the stocks offered by their competitors, so as to promptly take advantage of any improvement which may be made. In the seed trade, more than in any other, the permanency and the hope of increase of business depends upon the quality of the goods offered. There is every incentive for the ambitious seedsman, not only to study the results obtained in his trial grounds, but to continually raise his standard of quality. As an outcome of these conditions we have a gradual improvement in the stock offered, until American seeds are decidedly the best in the world, and European grown stock, if sold at all, must be offered at a considerable lower rate than American. The demand for better quality has brought about radical changes in American seed-growing, besides those that pertain to quantity and cost. Formerly, seedsmen depended for quality solely upon weeding out the poorer specimens; now the attention is directed more to the breeding only from the best. The modern American seedsman can give the pedigree of his favorite stocks as glibly and as certainly as can the horse or cattle breeder that of his choicer animals. There are many stocks, every seed of which is a descendant of not more than the fifth or sixth generation from some especially fine plant, the utmost care having been taken that there should not be a drop of any other blood introduced by pollen-bearing winds or insects. Sometimes a tomato plant is found with fruit which shows, to an exceptional degree, the excellencies of the variety. If it is so surrounded by ordinary plants of the sort, and the season is so advanced that it is impracticable to save from it seed which is, to a certainty, uninfluenced by pollen from inferior plants, such a plant is transferred to a greenhouse. Here it is increased by cuttings, which are the next season planted where they can not be affected by other plants, and thus may be obtained many pounds of seed which are practically all from the superior plant.

The care with which different strains are bred has resulted in a multiplicity of names, for which the seedsman is sometimes blamed,

but this is a thing which it seems difficult, if not impossible, to entirely avoid. The offering of an *unimproved* old variety, under another name, as something new and superior, cannot be too emphatically condemned, and the best American seedsmen never knowingly do it. They can not afford to do so. Thanks to the growing intelligence of those who buy and plant seeds, the field for such deception is every year growing smaller, and painstaking and honest American seedsmen are continually adding to their lists of friends and permanent customers. It is only a question of time when American grown seeds shall be the reliance not only of the farmers and gardeners of this country but of the whole world.

[The accompanying engravings present various features in the growing and harvesting of seeds. In Fig. 1 is shown a view of a seed farm trial grounds. In Fig. 2 is seen the gathering of onion seed; in Fig. 3 a field of pumpkins grown for seed. Fig. 4 presents a perspective view of a seed barn. In Figs 5 and 6 is seen a machine for separating seeds from pulpy fruits, like cucumbers and tomatoes. *A* is a shaft, with knuckle joints at a' and a'', and connected with horse or other power, giving about twenty revolutions per minute; *b* is a screen built on to *a*, and covered with wire netting of about one-quarter of an inch mesh; *c* is a roller built on to *a*, and mashing into a second c' by means of broad spiral cogs; *d* is a hopper, into which the fruit is shoveled; *e* is a slide by which the crushed fruit is directed into the revolving screen *b*; *f* is a vat to receive the seed and pulp from *b*, built in the ground, and lined by boards, so as to keep the earth out but allow the liquid to soak out; *g* is a jack, by changing which the screen *b* can be given more or less pitch.]

Breeding Lawn Grasses.—The trained eye in examining a lawn will find, as a rule, that it is made up of specimens that are wonderfully variable in many of their characteristics. Of course we now have in mind lawns that contain only a single species of grass. Some specimens are coarser than others, have a different habit of growth, while the shades of green are many. If the eye could pass from such a lawn to one in which all the specimens were uniformly

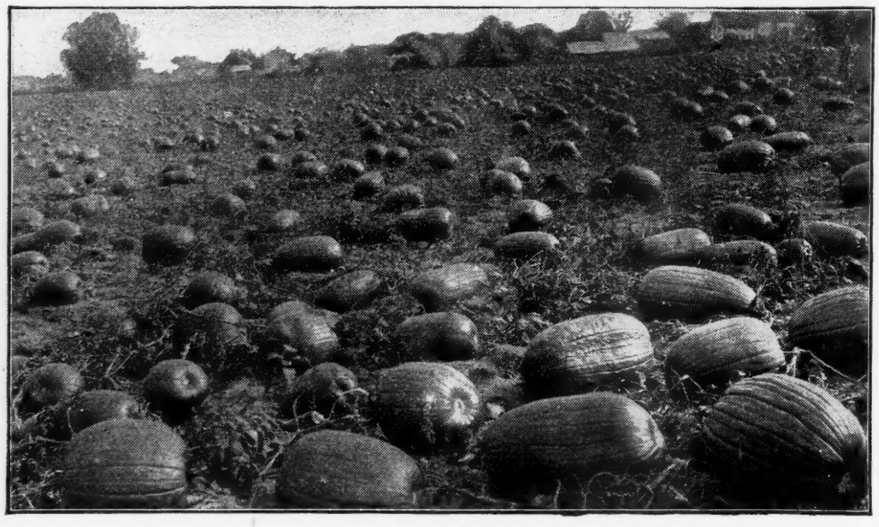


FIG. 3. FIELD OF PUMPKINS FOR SEED.

of the same size, texture and color, the contrast would not only be striking but pleasing. The effort is being made to select the best of the best sorts and, by multiplying the plants by dividing the tufts, to obtain as nearly as possible a uniform turf. It is hoped that this attempt to improve the "outdoor carpet" will meet with the support it deserves and that it will not be long before our parks and large estates will, among their other beautiful features, exhibit a turf that is without the many blemishes now so commonly met with.

PAST AND PRESENT OF THE SILO.

JOHN GOULD, OHIO.

The history of the silo, from the announcing of the theory by M. Goffart, of France, and the pioneer attempt of Francis Morris, of the United States, in 1873, in silo building and filling, to the present day, has been an evolution. The whole system has been invented from the beginning, and then reinvented, for many of the

FIG. 2. GATHERING ONION SEED.

theories, supposed to be correct at the start, were found either erroneous, not adapted to this country, or impractical when put in execution. To this end some of the best thought of this country has been centered upon this new departure of agricultural economy. That green crops could be preserved, with their food qualities not greatly impaired; that the result was better than crops dried; that it was not unhealthful; that it was economical; that it made the man who had a well filled silo independent of the winter, and gave him a year of 365 summer days, was so widely variant from old theories that it was received with incredulity. The claims of the silo were disputed from all sides, with a disproval that for a long time seemed as voluminous as the arguments of its adherents and praise from the affirming side. The discussion only served to awaken a more widespread interest, and every trial of the system won one convert to the faith, and confounded a score of those who were on the negative side of the question; and those who were waiting for proof confessed that the evidence was ample, and that silage was a good thing. As the days went by, the silos rapidly multiplied. The ranks of the scientific men and agricultural college professors began to waver, and the silo adherents were daily reinforced by those who had to admit that practice was proving superior to theory in silage demonstration. Prof. W. A. Henry, of Wisconsin, took a bold stand for the ensilage theory and, at the Station silo demonstrated the advantages of silage. From that day, the triumph of the silo was complete. One by one the scientists admitted that their deductions were defective and that silage was all right —"if a man wanted it." The experiment stations East and West built silos and published results. Farmers, by the thousand, built silos. Wisconsin, alone, in the fall of 1887, built 2,500, and doubled that number in the next two years, and other States built fast, if not quite so rapidly.

Then came a modification of the things claimed for the silo. Extravagant assertions were toned down to conform to facts. Reasonable claims were put out, and "wild ideas" corrected. The actual facts were published, and the results, conforming to the statements, made silage one of the possibilities, and in general the

later notions of silage and its value have not been subjected to much modification, and the claims of the silo now rest on successful, practical experience. That a crop is better when fed green, than dried; that the crop can be put up and fed in a more economical way than by the old methods; that the loss is less by the silo than by drying; that the waste of the manger is less; that the loss by the weather is nothing with the silo to aid; that the crop in the silo is made ready to feed at one operation, and by drying there is a daily preparing of food unknown to the silo system; that with corn there is a saving of husking, grinding and all losses of tolls, and other things, incident to dry feeding, and that a succulent food, saved in the silo, preserves its character more nearly than by any other plan yet proposed. These are the claims for the silo. No miraculous addition of food values, or unseen sources of supply, simply a matter of economy and better results. It enables us to supply a cow with abundant food for a year from one acre, instead of requiring four acres for pasture, and two for meadow. This is substantially the doctrine of the silo system. How to find out the principles upon which the preservation of silage rests? What kept it, the box, or something that had to do with ferments? If a ferment, why did it not go on until decay of the food had completed the operation? The silo must be made for the silage and its preservation, and not silage for the silo. To exclude air from the silage was the one indispensable thing to do. The ferment was caused by a bacterial germ of ferment, an organism not unlike the yeast germ or plant. Shut out the air, and as soon as the oxygen is exhausted, the ferment must cease to act, as this bacterium dies without oxygen. So when the heat of the silo by its own fermentative action reaches 125°, the bacteria are killed, as the yeast germ that makes the bread "light," is killed when the bread is put into the oven. Then, no more air, no more ferment, and the silage must keep. If air is excluded, there can be no further change in the silage, and it must keep so long as the walls and bottom of the silo remain impervious to the air. When these facts became well known, the whole plan of silo construction was modified. A box, if the walls were made air-proof, was, so far as it related to the keeping of silage, as good as a stone vault, and the cost of construction reduced from the hundreds of dollars to the decimals of a fifty cents, or less, per ton storage capacity, and that wood, well coated with some waterproof paint, was to be the silo of the future.

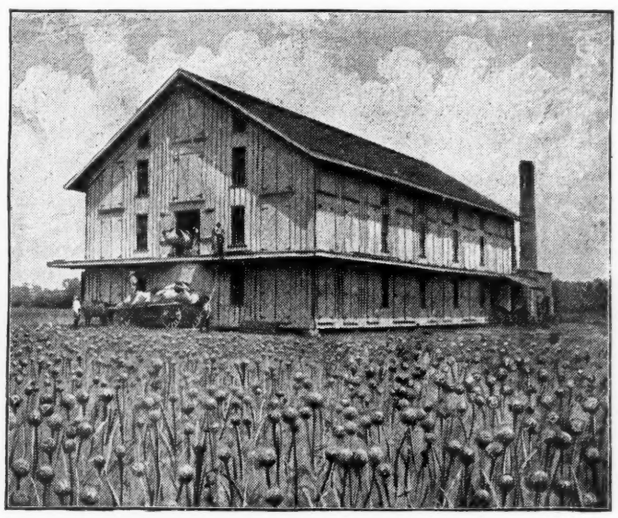


FIG. 4. PERSPECTIVE VIEW OF SEED BARN.

Then the crop. All could see that America's wonderful maize plant was the crop best adapted for the silo. The first idea was to grow an immense crop by heavy manuring, very thick seeding, so as to get from fifty to ninety tons of green material per acre. This proved a failure, from the fact that corn growing in the shade is possessed of little food value, and corn may be so grown that its own shade is more obstructive to its development than that of a spreading tree. Thus, the laws that govern corn growth had to be studied up and inquired into. It was soon proved that corn was a child of the sun, that its development, and power to store up food, was dependent upon sunshine and air, and it must have both in abundance, and that these two wants were only conforming with the laws of corn plant life. To grow the crop in a dense forest of its own kind, was to deny it the chance to draw from the air its stores of material out of which to construct its proportions of starch, sugar and other gifts of the sunshine. When these demands were complied with, then the "greenness and water" quality of the fodder disappeared, and the large corn plant, pound for pound, became to have equal food value with the smaller varieties, and so, quickly, in good corn-growing localities, became the silo man's chief crop for his silo. When to cut this corn and fill the silo, and how, is now generally settled. Cutting the corn at the glazing stage, rapid filling, little tramping, a very light cover, and leaving it undisturbed until ready to feed the cattle, are the methods now followed with success. All this in contrast to first teachings; big corn, thickly drilled, cut at the tasseling stage, slow filling, heavy weighting, and expecting and securing sour silage. Now comes the cheap silo, the big, mature and fully developed corn crop, left to stand until the grain is glazed, rapid filling and covering, and resulting in sweet silage with scarcely a trace of acid, and all this secured at a nominal cost, as compared with the experience of a few years ago. To-day we find silo and silage experience substantially occupying the following position, and with the indorsement of about every scientific man in America, and with a united agricultural press advocating the silage system as one of the hopes of the agricultural future.

This article does not enter into the philosophy of the ensilage system, much less defends it, as it is now a farm system that needs no defense. Long tables of comparative feeding trials are not given, as the everyday report confirms the claim that a succulent food is better than the same food dried. No table of losses is given, as all comparative tables of analysis show that the loss in food nutrients is more in drying a crop by the usual field methods, than the loss by ferment in the silo. The cost of silage, compared with that of the same crop dried, is not given, as the different conditions that enter into the problem in different localities vary so, that it would only be a guess at best. But this is patent, a man who ever builds and fills a silo, very rarely abandons it to return to the old way. That it is the cheapest way to harvest the corn crop, and feed it, and suffer the least deterioration of storm, wind and vermin, is now universally conceded; hence, need not be discussed. That it is peculiarly the great food for the dairy from October to May, is no longer disputed. The man who chooses to build a silo is no longer laughed at. That the silo is one of the most important steps in the progress of farm economics, admits of no doubt.

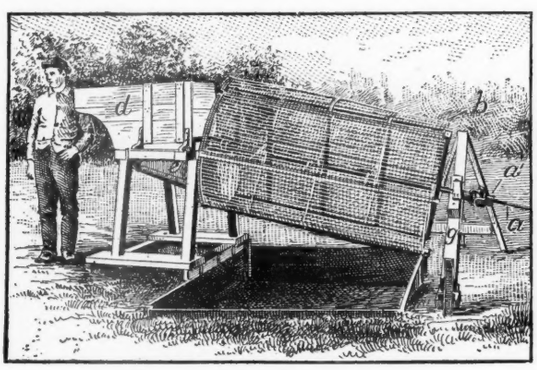


FIG. 5. SEED SEPARATOR.

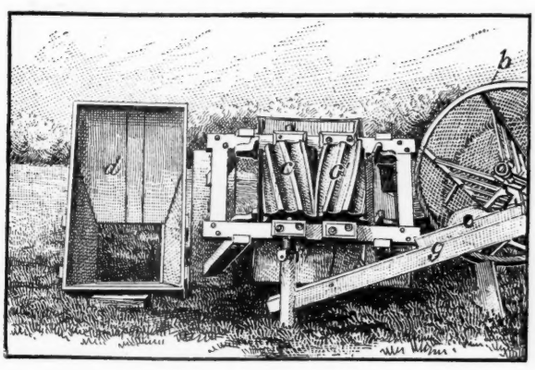


FIG. 6. PLAN OF CONSTRUCTION.

WHEAT GROWING IN THE NORTHWEST.

I. C. WADE, NORTH DAKOTA.

There is a marked difference in wheat growing as it was pursued thirty years ago in Western Michigan and as it is now in North Dakota. Then the writer plowed and re-plowed, dragged and cross-dragged thirty acres of fine wheat land. When harvest time came, the father and son, with the help of neighbors, cut the crop with an old-fashioned cradle, and bound it by hand. Now, in North Dakota, one man, with modern appliances, crops one hundred and sixty acres. The crop is quite as large per acre, and the price per bushel as high as were the crops from the limited acreages of thirty years ago. Moreover, the market is now only three to five, or at the most, ten miles from the farm. In those Michigan days, after the fall wheat was safely in the ground for the next year's crop, came the event of the year—hauling the present year's wheat crop thirty-six miles to Kalamazoo, where it brought an average price of seventy-five cents per bushel. A large part of the hauling was done with ox teams, each load containing thirty-five bushels of wheat, and the round trip taking three days. Yet those trips to and from Kalamazoo were not without their pleasures and mild excitement. When we struck the plank road we generally found a string of teams a mile long. The lunch of cold chicken and wholesome bread and butter, with maple syrup, or pickles, was eaten with a gusto which can be understood only by those who have been there. And when the market was reached, the wheat unloaded, and a good square meal enjoyed, how we roamed through the future "Celeryville!" But these explorations were brief, for we had to retire early enough to obtain the necessary sleep for a five o'clock breakfast and an immediate start homeward in the morning. That pleasant return drive, the joyful arrival home, the display of purchases, and relation of incidents, made a pleasant evening, followed the next morning by another start for market. And this was repeated until the entire crop was marketed. The changes of the last thirty-five years, great as they have been, are not revolution, but evolution.

To-day, the North Dakota farmer hitches four good horses to his riding gang, or eight on his double gang (four plows, each throwing a fourteen-inch furrow), and turns over six to twelve acres per day. No stumps, no stones to throw out the plow; no knocking a fellow's ribs with plow handles. But, mounted on a spring seat, he rides along as easily as in a spring-seated wagon. His mind is tolerably free to think of his Alliance, the McKinley Bill, Prohibition, or any other topic of the day; goes home at evening, looks over several newspapers, and retires happy.

In the spring, with the same four horses, he hitches on to his press drill—seeding better than it was ever possible for him to do in the olden time, even on well dragged land—putting in fifteen to twenty acres of grain daily, and on ground plowed the previous September and October, with no further care. The frost and snow has fitted the ground into as fine condition as could be done by hand. The seeding is done in April and the first half of May. And how the wheat grows! No winter frost or winds to make afraid, and in ninety to one hundred days. The North Dakota farmer hitches on the same four horses on a seven-foot cut binder, and each day finds fifteen acres nicely bound; or, what is much better, he hitches his team to a header and gets three neighbors to help him with three two-horse wagons, and an extra man and boy, puts in stack thirty to thirty-five acres per day. If damp weather should happen, he always has plenty of ground to plow, and the comforting bit of knowledge that rain cannot spoil his wheat, as it is not outstanding in the shock, and headed grain will stack as safely and securely as bundled grain. Besides, his grain, headed, is ready any time for the thresher, who is now equipped with men, machine and teams, tents, cooking apparatus, and threshes out the wheat, delivering in sacks, 1,200 to 2,400 bushels daily, for seven or eight cents per bushel, or ten or twelve, if from the shock. The farmer's expense of hauling seventy-five to one hundred bushels, at a load, to the near elevator, which is in sight of most wheat farms, is usually one-half to one and one-half cents per bushel. He gets his cash according to whether the "bulls" or "bears" are on top, and thus within one hundred days from the time planted, may have his cash.

Such is North Dakota wheat-raising, at the rate of over 50,000,000 bushels the year, 1891. The picture is not fancy painted or exaggerated, but facts. The smaller farmer makes a much better per cent., as the labor question is the serious one here. Thousands of active young men can find remunerative employment from the first of April until the fifteenth of November. Altogether, the cost will be five to ten dollars per acre for farming in North Dakota, and nearly ten times as much more raised, if all our good wheat land was cultivated. Such are the almost boundless possibilities of this new State. What the farmer does with the money, and why he is in debt and unhappy, is a problem for political economists.

SALT AS A FERTILIZER.

JOSEPH HARRIS.

According to the modern notion of "a complete manure," neither salt, plaster nor lime is a manure at all. A "complete manure," we are told, is anything that contains nitrogen, phosphoric acid and potash. But salt, plaster, and lime contain neither nitrogen, phosphoric acid nor potash. And, therefore, they are not manures, either complete or incomplete. If we accept this notion there is nothing more to be said. But while nitrogen, phosphoric acid and potash are unquestionably the three ingredients of plant food most generally deficient in our soils, it is very certain that they are not the only substances that will increase the growth of our crops. Lime renders the nitrogen and potash of our soils more available; plaster makes clover and corn grow more luxuriantly, and I have seen a decided benefit from an application of salt on mangel-wurzel, barley and wheat.

John Johnston, "the father of underdraining," and one of the most successful farmers of his time, used salt on his winter wheat for many years. He sowed about four bushels per acre broadcast on the land at the time of sowing the wheat in the fall. He once showed me a large field of wheat that was also sown with salt as above, except a narrow strip running across the field. The effect was most marked and beneficial. The wheat on each side this unsalted strip was taller, the straw brighter and stiffer, and the heads better filled. "Why did the salt do so much good?" Frankly, I do not know. There are hundreds of instances where salt has had a decided effect; there are more instances where its application has done no good. "Agricultural salt" has been offered our farmers at very low prices, and many have tried it; but for some reason or other its use does not extend. "Do I use it?" No. "Do my neighbors use it?" No, certainly not, as a rule. Where one farmer uses salt, a hundred continue to use, year after year, superphosphate.

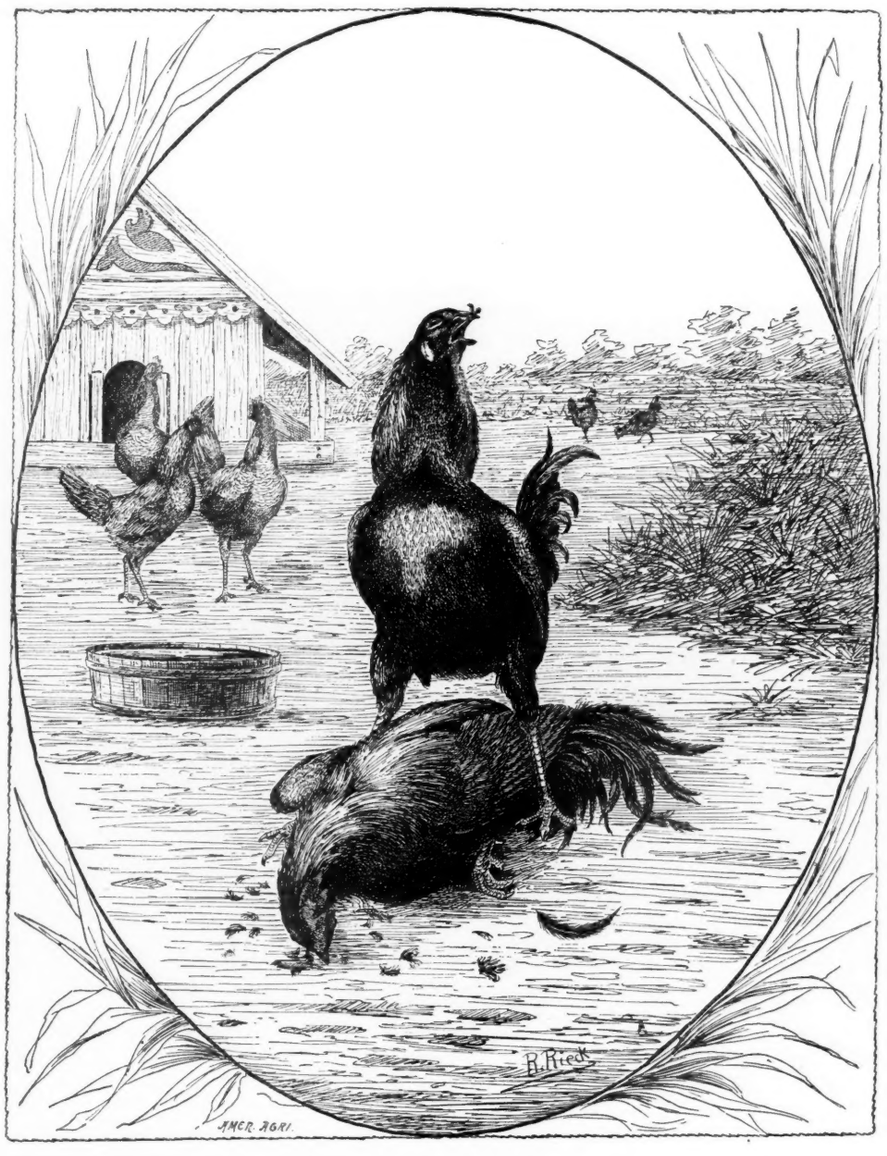
Hundreds of experiments might be cited where salt has proved beneficial. Why it is sometimes valuable and oftentimes not, we do not know. We do not understand its action. We are nearly as ignorant in regard to the action of plaster. For some years we have supposed that salt and plaster checked the evaporation of water through the leaves of the plants, and thus lessened the injurious effect of drought. Some recent experiments would indicate that plaster was favorable to the growth of the bacillus or "nitrate yeast" that converts organic nitrogen and ammonia into nitrates and thus rendered the nitrogen immediately available for the growth of our cultivated crops. Possibly salt acts in the same way. All that we know at present is that salt is frequently very beneficial on some soils and for some crops. One of my neighbors who grows cabbage, onions, carrots, etc., on low, mucky land depends almost entirely on salt as a fertilizer. He frequently raises a fine crop of late cabbage with salt alone. On similar land of my own in the same swamp I find superphosphate and a little nitrate of soda highly beneficial. So that it would seem probable that salt develops plant food from the soil. And it is a question for consideration and experiment whether it is cheaper to furnish the phosphoric acid and nitrates in the form of manures or fertilizers, or whether we should use salt, lime or plaster to develop them from the soil. If a given amount of money in superphosphate and nitrate of soda will produce as large crops as the same amount of money expended in salt, lime or plaster, then, of course, the fertilizers are to be preferred because they furnish the plant food rather than develop it from the store of organic matter in the soil.

The Barnyard.—Out of the barnyard are the issues of crops. Some farmers have no barnyards, and they are the ones who complain of hard times. The no barnyard system of farming will answer only in those places where the soil is still rich with the virgin fertility, and they are getting, like the bison, to be a rare thing in this country. Save the manure. Waste your swill, and let the apples decay upon the ground, if you will, but save the manure. Let us look into a man's barnyard in winter, and there will be no trouble in determining about the size and fullness of the granary, and how the daily table is supplied with food. Build the whole farm upon the barnyard.

THE BLACK-BREASTED RED GAME.

H. S. BABCOCK.

The *crême de la crême* of the fancy, is the Black-breasted Red Game. Upon the production of no fowl has more time, skill, and money been spent, and no fowl has responded more freely to the manipulation of the breeder. The Pit Game, a comparatively low-stationed, big, high-tailed, long feathered fowl, was the parent stock from which has been evolved a fowl in which "reachiness" is the prevailing characteristic. The modern exhibition Game is a long-necked, long-thighed, long-shanked fowl, with short, hard plumage, and a small, low-carried tail. To produce this result, years of careful selection, not without suspicion of a cross with the Malay, have been necessary, but the result has been a triumph of the breeders' art. The Game is a large family, and, confining our attention to the exhibition Game, alone, we have Blacks, Whites, Red Pyles, Silver Duckwings, Golden Duckwings, Brown Reds, and the Black-breasted Reds. The latter is the most popular variety, and has had the most care bestowed upon its breeding. Better black-breasted Reds can be had than of any other variety, though the Brown Reds and Red Pyles have been bred to a high standard, while the beautiful Duckwings and the Blacks and Whites have been comparatively neglected. It is really difficult to understand why this is so, especially in the case of the Duckwings, but the fact is capable of verification at any large exhibition. But whatever the reason, which has placed the black-breasted Red at the front of the Game class, it is very certain that it is there, and that, to one who appreciates the Game type, it is an exceedingly beautiful fowl. It has the clean-cut build of a thoroughbred, a close, hard, and brilliant plumage, and color, which, in the male, is exeeedingly rich and variegated.



THE CONQUERER ANNOUNCING HIS VICTORY.

In a good black-breasted Red Game cock, we look for a long, lean head, a long, slim, snaky neck, a broad but not prominent breast, prominent wing fronts, great breadth across the shoulders, a straight back sloping to the tail, narrowing from shoulder to stern, a short wing, a hard, compact body, a closely tucked up stern, a long, well developed thigh, a long, smoothly scaled, stout shank, long, straight toes, the hinder of which is set low down, and a short, small, closely folded tail, having a few sickles and hangers that are fine and narrow. We expect to find very short, hard whalebone-like plumage throughout. The female's shape is almost identical to that of the male, and both have an upright, bold, soldierly carriage, giving them the appearance of great activity and indomitable courage. In color, we find in a first-class cock, a light red or orange head and hackle, a rich, somewhat darker, red back, a saddle, colored like the hackle, a wing, the bow of which is rich red, the bay a bright bay, and the bur a shining metallic black, and the breast, body and tail a solid rich black, the sickles of the tail having a beautiful green luster. The shanks are willow. The hen is clad in a more sober dress of brown, the hackle striped with black, the breast of a light salmon color, the brown of the body-coloring being penciled with black. The tail feathers, except the two upper ones, are of a dark brown color, the two upper ones having the same black penciling, which is found on the back, wing, and body; the shanks and toes like those of the male, are willow. In Games, more than in any other breed of fowls, the shape makes the bird. Color, indeed, counts in the score, and more under the latest than under previous standards, but shape is the first consideration. Without good shape, be the color never so perfect, a Game fowl has no chance of winning a prize in anything deserving the name of competition. While the black-breasted Red Game is primarily a fancy fowl, yet, like all other fowls, it is not devoid of useful qualities. It is a thoroughly good table fowl, for, despite its long neck and long legs, the breast is full and meaty, and the body is plump and well fleshed. It is a moderate layer of medium-sized eggs, but the eggs are exceedingly rich and nutritious. Game eggs and Game poultry are good enough for the table of the most exacting taste. The chickens are rather delicate, and the fowls are not so hardy as some breeds, as for example, the Asiatics. This is probably due to the long continued practice of close matings, which has been resorted to in order to perfect the ornamental qualities of the fowl, and it is conceivable that, if less inbreeding were practiced, the black-breasted Red Game might become one of the most useful practical fowls which we possess. But it is probable that the practice which has perfected the ornamental qualities of this fowl, will be continued, for fanciers will be quite willing to forego great egg production and more hardiness, in order to produce the highest type of the exhibition bird; and they find justification for their position in the fact of the enormous prices which some of the finest specimens command. I remember three fowls, two cocks and a hen, selling a few years ago, at Indianapolis, for the sum of three hundred dollars. While this is a large price for Americans to pay, it has been greatly exceeded in England, for there as many pounds have been paid for a winning black-breasted Red Game cock as dollars have been paid in this country. Five hundred or one hundred dollars will purchase a good many dozen of eggs or pounds of

poultry for culinary use, and fanciers are scarcely to be blamed if they prefer to sell a single bird for enough to supply their table with eggs and poultry for a whole year, than to raise the eggs and poultry for their table.

[Our spirited engraving herewith presents the characteristic features of this valuable breed in a most vivid manner.]

COTTON-SEED MEAL FOR MILCH COWS.

Prof. George W. Curtis, director of the Texas Experiment Station, in August, 1890, issued a bulletin (No. 11) giving information that when cotton-seed meal is added to the ration the effects of it on the churnability of the cream is most marked. Such cream requires about ten degrees higher churning temperature. This was quite unexpected, but not any more so than the facts we now find set forth in bulletin No. 14 of the same Station, for that teaches us that when cotton-seed meal is used in the ration, and the milk set by the gravity process it greatly facilitates the cream's rising.

In order to find the exact relationship of this ration with the rising of cream a number of very careful experiments were made. Two small herds of four or five cows each, at the same interval from calving, and with other individual peculiarities alike, were used. The rations to be tested were fed to the cows at least twelve days before any samples of milk were taken. The whole milk and the skim milk were analyzed. The sampling was done by the professors in charge, and the skimming was done with great care to get all the cream, the Fairlamb cans being used.

Table No. 1 shows the effect on gravity creaming at a high temperature (70° F.) with cows well along in milk, giving an average of 18.4 pounds of butter actually lost in the skim milk out of every one hundred pounds present in the milk set, as against 30.9 pounds actually lost from every one hundred pounds present when neither cotton-seed meal nor cotton-seed was used.

Table No. 2 shows the effect on gravity creaming at a high temperature (70° F.) with cows less advanced in milk than in Table No. 1, but not fresh. The averages show a result almost exactly identical with that shown by Table No. 1, giving an actual loss of 22.9 pounds of butter fat in the skim milk on a cotton-seed meal ration, as against 31.8 pounds lost in skim milk out of every one hundred pounds actually present when no cotton-seed meal was used.

Table No. 3 shows the effect of gravity creaming at a high temperature (70° F.) with cows fresh in milk. There is a loss of 11.3 pounds of butter fat in the skim milk on cotton-seed meal ration, as against 14.9 pounds lost out of every one hundred pounds actually present when no cotton-seed meal was used. These differences are very striking, and, being developed under the most carefully conducted experiments, must be of very great value to the dairy cow feeders of the Southern States, and recommend cotton-seed meal to those of the North. There seems in these experiments to be quite a large per cent. of loss even under the most favorable circumstances, as compared with the work of deep cans set cold at the experiment stations in the Northern States. This fact, however, does not affect the result noted, for it is only a question of relative yields, and taking one to be as well done as the other, the relative results are correct. It was further found that when the centrifugal machine, the De Laval separator, was used the cream was all gotten out of the milk without regard to what was fed, or how long the cows had been in milk.

It was a strange feature of the experiments that the cow long in milk should yield milk so difficult to get the cream out of. It is an old complaint that such cream is very hard to churn, but as the milk is always richer at that period of lactation, the idea it conveyed to the dairy mind was that it parted with the cream more readily. We are glad to note that Prof. Curtis promises to conduct some exhaustive experiments in this direction in order to find out the percentage of this delay as the cow approaches parturition.

Dairy Education Needed.—We desire to call the attention of young men and women of the farm to the possibilities of life successfully achieved by attending the dairy schools within their reach. In the first place the students must be in dead earnest—no half way work will accomplish anything. It is now admitted by all the dairy papers that there are many more creameries and cheese factories "putting up" with the operators employed than there are that are satisfied with them. In other words, there is a dearth of good, intelligent, well posted cheese and butter makers open for contract with the innumerable factories and creameries springing up all through the Western, Eastern and even Southern States. In looking over this matter we find that when the dairy schools first started in England men carried off all the honors, but gradually the young women of the farm took a hand in the business and now they "rule the roost," and there are many more female than male graduates from these dairy schools. We hope soon to see this the case in the United States, and the latest suggestion that young women be employed to keep the factory accounts of the receipts of milk, percentage of fat, and sales, is a good move in that direction, and should be followed by more creameries.

IMPROVED CREAMERY MANAGEMENT.

JOHN GOULD, OHIO.

The success of the St. Albans, Vt., creamery marks a new departure in creamery management. Under the system there adopted, it is now quite possible to establish creameries in territory where, with the usual plans and methods, it would, if attempted, only bring loss and disaster. By the St. Albans system, the creamery is made up of a number of auxiliary establishments, from which the cream is sent on to a central depot, where it is worked up into butter. By the old method each creamery is independent of all others, and the securing of from two hundred and seventy-five to three hundred cows was essential to success. By the new plan separators are located at favorable points. Wherever the milk of from fifty to one hundred cows can be had, a large-sized hand separator is used; and, where a larger number can be secured, a power separator is put in, and the cream taken off, to be forwarded to the central station. This makes coöperative butter-making next to a home affair. The collection of milk is then local, no long hauls, or expensive freightage. The farmer takes the milk to the nearest separator, the cream is quickly whirled out of it, and the farmer returns home with his eighty-eight pounds of the one hundred pounds of new milk delivered. This discreamed milk is sweet, new, and of good feeding quality. If mixed with a little oil-meal jelly and wheaten shorts, young calves will thrive as well on it as on whole milk. This new plan is the nearest to emancipation from the churn, for the housewife, of any scheme yet chanced upon. The whole labor and anxiety of creaming the milk at home with deep setters is obviated. The milk does not come into the house, even, but is taken from the stables to the nearest station, and there separated, and the one milk can is the total amount of dairy utensils to look after. At the station the milk is creamed by centrifugal force, and there is no need for tests of oil, butter fats, or shake churns. The new separators skim each man's milk practically alike, and "knows neither breed, time of lactation, nor water!" The butter fats are taken out, and the amount of cream credited to each man. The resulting butter, made uniform, brings the top prices of the market. The housewife is thus relieved from all labor, and in return gets a larger yield of butter per one hundred pounds of milk than can be secured by any home method of creaming. The butter is, or should be, of the finest, and sold for money, not exchanged for groceries, and cash always buys more than will barter or exchange.

This plan is capable of any degree of expansion. The central creamery that can run successfully fifty of these auxiliary creamery stations can as well overlook one hundred. Where trains cannot be had to collect all of the cream, teams can convey to the nearest railway point, and the coöperative plan is again successful.

It may be possible that the butter extractor can be made to do efficient duty in this new scheme. The separator asks for twelve to fifteen pounds from each one hundred pounds of milk. This last must be transported to the central creamery. The extractor takes only the butter fats, three, four, or five pounds to the one hundred pounds to be sent on, and leaves behind ten pounds more skim milk to the one hundred, for the farmer, than does the separator. This is quite an item in eight months with a dairy of thirty cows. The signs of progress in the dairy are everywhere visible. The dairy is going to pay better in the future, because managed and looked after better than it has ever been before.

Care of the Colt's Feet.—The feet of the colt need a great deal of attention during the winter. When he is running in the yard or standing in a loose box on a pile of manure there is nothing to wear down his hoofs as they grow out. It is necessary, therefore, to trim them down to the proper shape with a knife and rasp. Some hoofs will be found to have grown out at the toe, and others at the heel. Both are bad and often result in spavins, windgalls, contracted feet, curbs or ring bones. Many young horses have unsound feet and limbs and their owners think the unsoundness is hereditary, while in reality it came from neglect.

PROFIT FROM NATIVE COWS.

E. ROCKWOOD, MICHIGAN.

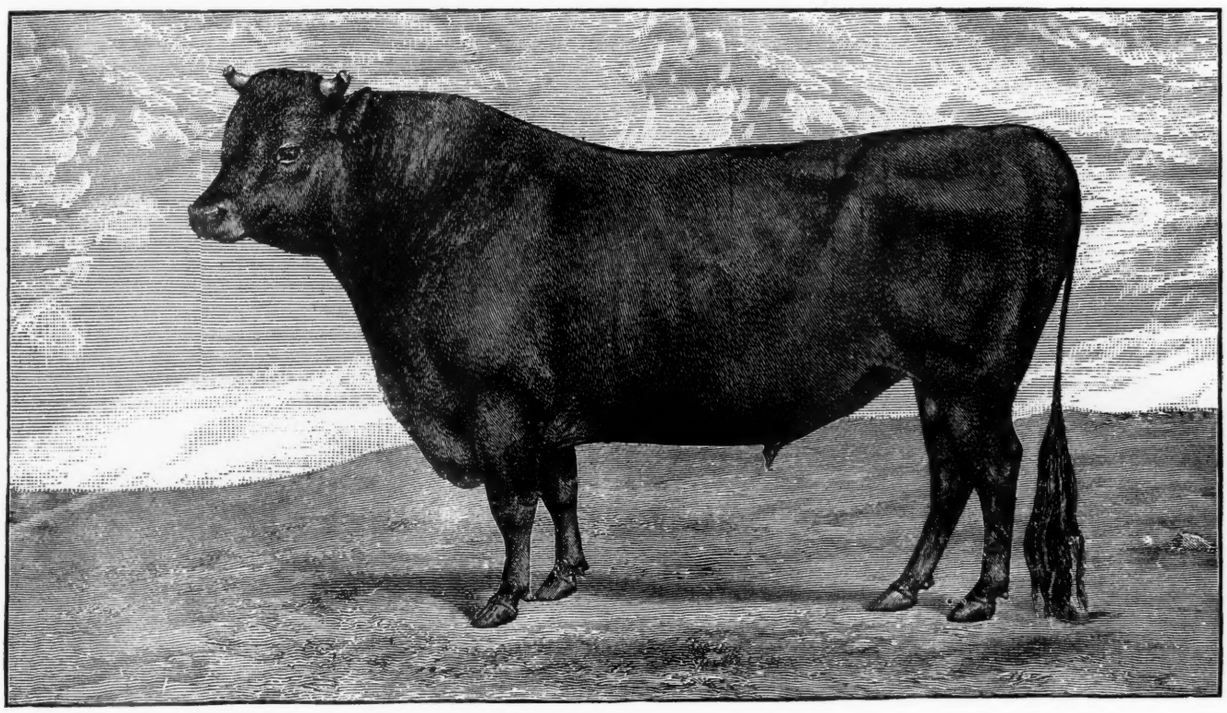
We made two tons of butter last year from sixteen cows. One of these cows is a Jersey, one a Guernsey, two are grades, and the remainder natives. Of course we might have done much better had the entire herd been Jerseys or Guernseys, but it is desired to show that with the right treatment, even the much despised "scrub" cows may be made to give a good profit to the farmer.

Our cows are mainly raised from home stock; the most promising heifers from the best cows being saved for the purpose. By this means, in a few years a herd is obtained that is far better than could be bought in the general market. A pure-bred Guernsey heads the herd, as we consider Guernseys equal to the Jerseys, from a butter standpoint, and they are certainly more docile. The cows are fed on the theory that a cow is a machine for converting food into butter, and, that up to the extent of her capacity, the more she eats the more butter she will make. But one cow's capacity should not be judged from another's. What will be a full feed for one cow, may not be enough for another. Each cow should be judged individually as to her capacity for converting food into butter. The winter grain food for the herd consists of one part ground oats, and one of corn meal, and two of wheat bran mixed together. Of this a heaping panful, or about six quarts, is fed to each cow twice a day. They are given a feed of roots at noon, when we have them. A spring furnishes an abundance of pure water without going outside the barn yard. Salt is always at hand to which they help themselves as they want it. The cows are encouraged by extra feed, if necessary, to keep up a flow of milk until about a month before calving. They are then dried off. Sometimes a cow will, after all efforts to the contrary, go dry two or three months before calving, but such a cow, unless an exceptionally deep milker when in full flow, is soon disposed of.

Now, as to the cost of producing the butter, and the consequent profit to be obtained, the following figures will show for themselves: At market prices for the grain, our butter costs, through the winter, not more than ten cents per pound, that is counting the grain alone, the cut cornstalks, comprising the rough feed, not being taken into consideration, as we offset that against the manure. In summer, when on pasture, of course it amounts to less. The butter is sold to private families at twenty-five cents the year round. This I know is less than might be obtained in a better market, but it is considered a good price here. The butter, then, brought last year $1,000. Allowing ten cents a pounds as cost of feed, which certainly is ample for the entire year, we have $400.00, which still leaves $600.00 as profit. This is an average of $37.50 per cow, not a bad profit for a "scrub." Not that I advocate "scrubs;" certainly not, but even the scrub may be made, by good management, to yield some profit.

A NOTED JERSEY BULL.

It is frequently stated, upon good authority that there are more pure-bred Jerseys in America than on the island of Jersey. Another and still more significant fact is that, like cattle of other British breeds, the Jerseys in this country more than maintain the highest standard ever reached in the original habitat of the breed. The performances of Eurotissima and Bisson's Belle far surpass all known or recorded achievements of Jerseys in their island home. Nor is it alone by great butter records of individual cows that American Jerseys have become distinguished. Some of the bulls have made great reputations as sires for the high and uniform excellence of their progeny. One of these is Exile of St. Lambert, 13657, whose portrait is given herewith. He is owned by P. J. Cogswell, Rochester, N. Y., and is the sire of twenty-seven tested cows and heifers. One of these, Exile's Belle, 40524, produced



EXILE OF ST. LAMBERT, 13657.

thirty-two pounds seven ounces of butter in seven days, and one hundred and twenty-two pounds six and one-half ounces in thirty days. The aggregate yield of the twenty-seven tested daughters of this bull would be regarded as a high average yield for one hundred "native" unpedigreed cows.

Exile of St. Lambert, 13657, was calved June 15, 1883. His sire was Bachelor of St. Lambert, 4558, his dam Allie of St. Lambert, 24991. In color he is solid lemon fawn shading to squirrel gray, with black tongue and switch. His weight, at three years old, was 1,600 pounds. Large and massive as he is, there is not a suspicion of coarseness in his make-up. As is faithfully shown in the illustration he has all the pure points of his breed in an eminent degree. His dam, Allie of St. Lambert, 24991, is a wonderfully fine specimen of a butter cow. Her udder has been repeatedly measured when its circumference was sixty-three inches. In the depths of a Canada winter she made twenty-six pounds twelve ounces of butter in one week. She and her full sister, Ida of St. Lambert, have the highest combined milk and butter record of any Jerseys. Exile of St. Lambert, 13,657, has demonstrated his power of transmitting to his descendants, not only his grand constitution, but also his butter inheritance. So marked is his impress upon his progeny that they may readily be recognized in the midst of a herd of other Jerseys. Such a bull is a great acquisition to the country, and he has made an impress which will extend through many generations.

DEVELOPMENT OF COTTON CULTURE.

J. S. NEWMAN, DIRECTOR SOUTH CAROLINA AGRICULTURAL COLLEGE.

Probably, in no other industry of such magnitude is there so wide a chasm between its different votaries as between the intelligent, advanced, progressive cotton planter, who has availed himself of the teachings of the cognate sciences, and pursues his avocation in the full glow of their reflected light, and his plodding, superstitious, untaught and unteachable neighbor. The cotton

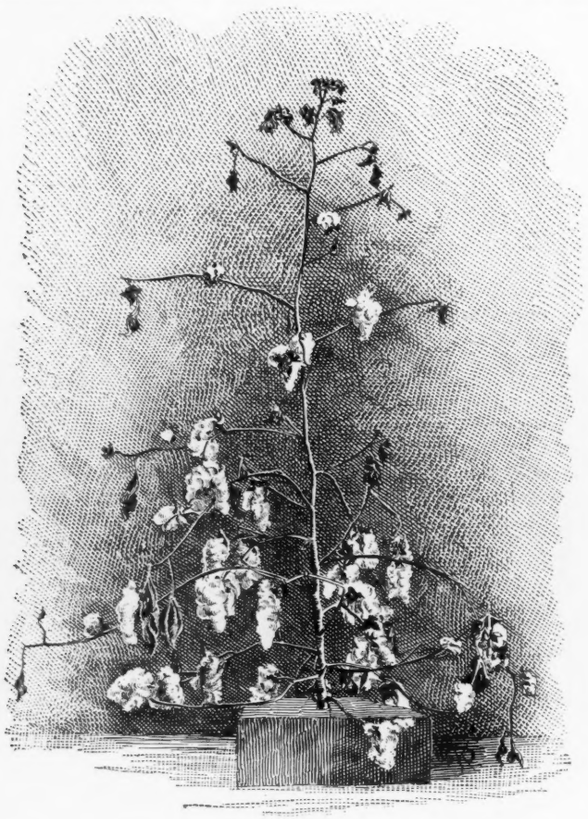


FIG. 1. PLANT OF PEELER COTTON.

plant possesses wonderful elasticity of development. It promptly accommodates itself to the conditions which surround it. It responds in larger and better production to intelligent cultivation and judicious selection and feeding. It retrogrades in all useful qualities until it becomes assimilated to its ignorant, thriftless cultivator.

There is as much difference between the improved cotton of to-day, on which the number of balls rivals that of the leaves, and the long-jointed, straggling varieties grown fifty years ago, as there is between the rangy, flat-sided Texas steer and the well-rounded, broad-backed Shorthorn. The improvement wrought in varieties of cotton by judicious selection, high feeding, and skillful cultivation, has no parallel in any other cultivated plant, unless we find it in the potato, or the tomato. In breeding cattle we rely upon the Divine promise, that "like shall beget like," and to insure progress, "breed from the best." The same principles and practice have resulted in the establishment of such prolific varieties as the "Peerless," and others, which present a most striking contrast with the old "Peeler" variety.

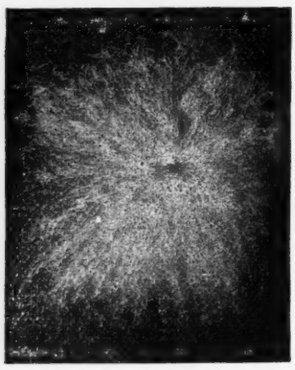


FIG. 3. SEED AND LINT OF W. A. COOK COTTON.

Agencies Employed in Improving Varieties.—The type of plants, which reproduce from the seed annually, may be rapidly changed by selecting the best products from plants approximating the type desired. Auxiliary to this has been planting at such distance as will give room for normal development. In conjunction with these, two other potent factors have operated, viz.: Perfecting the physical condition of the soil by thorough pulverization and the accumulation of humus, and thereby increasing its power of absorbing and retaining moisture. The needs of the plant, as well as those of the soil, have also been carefully studied, and the food necessary to produce the maximum development of plant and fruit supplied. All of the conditions surrounding the plant, physical as well as chemical, have thus been rendered favorable for its most perfect development. Variations resulting from such favorable environments have been closely observed and utilized in establishing the type desired.

These agencies resulted in improvement in the form and productiveness of the plant, but have only partially affected the fiber. After establishing a variety of sufficiently prolific habits in the upland short-staple species (*Gossypium herbaceum*), the next step was to improve the lint by hybridizing this with the long staple, or Sea Island (*G. Barbadense*). This has resulted in material improvement in the length and fineness of staple at the cost of a small reduction in productiveness. In illustration of the improvement in the length of fiber, we have only to compare the "W. A. Cook" variety, recently established, with the "Dixon," a variety of forty years standing. These improvements have effected vastly increased yield in the short staple varieties, and corresponding enhancement in the value of the lint of the long staple upland.

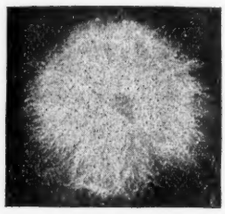


FIG. 2. SEED AND LINT OF DIXON COTTON.

Improved Cultivation. — There has been a corresponding advance in the methods of cultivation as well as in the implements used. The extent of these improvements becomes obvious by comparing the old "Scooter" stock, made on the plantation, with hatchet and drawing knife, having a shingle nailed to the beam to prevent covering the young cotton while "siding" or "barring" it; and the most improved adjustable iron beam stock with the Terrill heel scrape attached. Under the old system the roots of the plant were so lacerated by deep cultivation as to seriously check production, even experienced cultivators contending that the lateral roots of the plant did not exceed one foot in length. Yet fully developed plants show the roots nine feet in length, justifying the modern system of flat and shallow cultivation, which saves labor and increases production ten to twenty per cent. over the old system of

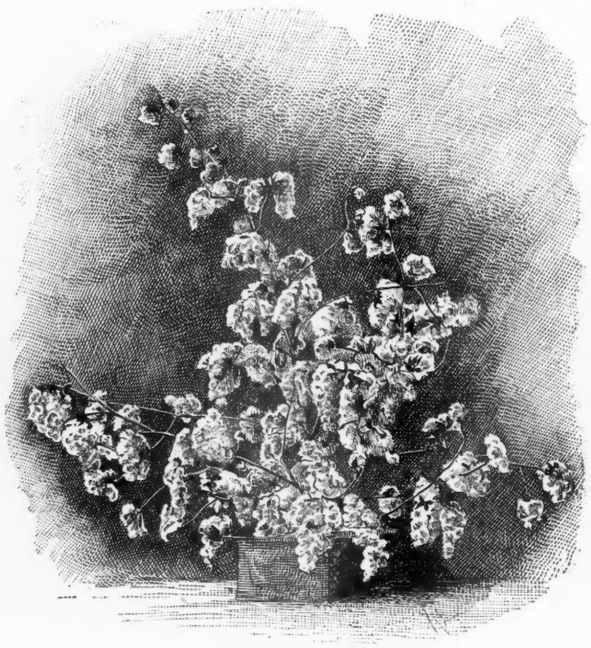


FIG. 4. PLANT OF PEERLESS COTTON.

deep cultivation, which involved a mutilation of the roots. The use of wide heel scrapes instead of the scooter, the solid sweep and turn plow has not only increased the yield per acre, as stated, but has

diminished the cost of cultivation by reducing the number of furrows required to make the crop, and almost entirely dispensing with hoe work.

Harvesting.—The possibilities of cotton production have been, and will continue to be limited by the failure, thus far, to successfully "chop" and "pick" by machinery. A chopper and cultivator, combined, has been invented, which does excellent work upon smooth, level lands, but is too costly and complicated to come into general use. The cotton harvester, exhibited last fall, gathers cotton rapidly under conditions specially favorable for its operation, but there are practical and insurmountable difficulties yet in its way. It cannot be operated until the whole crop has opened. This renders its general use impracticable, since, in some seasons, storms will destroy the crop while waiting upon the harvester.

Present Conditions.—The general use of fertilizers has shortened the harvesting season by hastening the maturity of the crop. A 7,000,000 bale crop is harvested earlier than a 3,000,000 bale crop was before their introduction. The use of fertilizers has advanced the area of profitable cotton culture from fifty to one hundred miles further north by hastening maturity. We have advanced from the wallet to the bale, from the rope tie to the steel band, from the tall wooden screw press, worked by mule power, to the iron screw driven by steam. The lint-room, into which the ginned cotton flew from the brush like pure flakes of snow, is a thing of the past except upon the farms of a few "fogies." The horse-power has now been replaced by the steam engine, the old gin and lint-room by the most modern self-feeder and condenser.

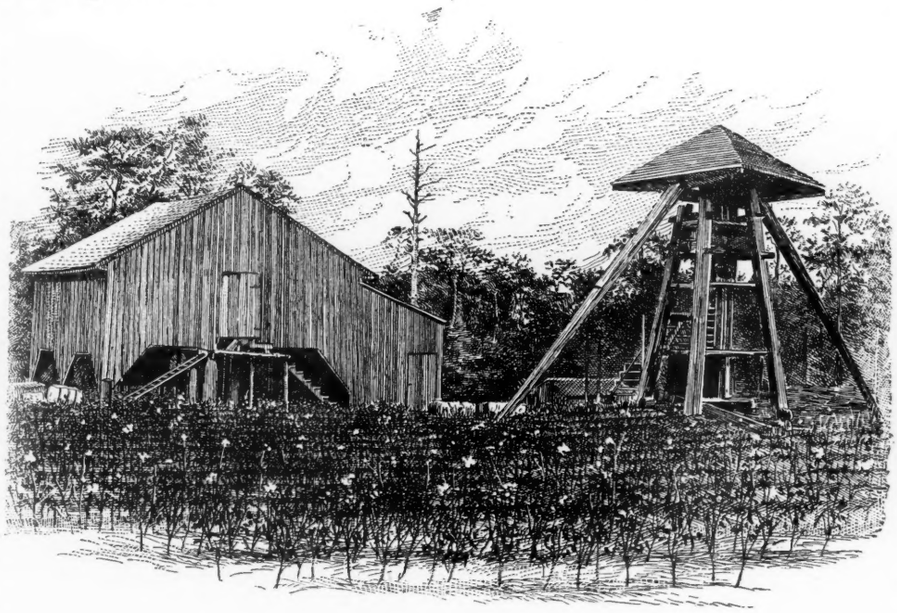


FIG. 5. OLD-TIME SCREW AND COTTON-GIN HOUSE.

The appearance of the cotton caterpillar no longer spreads dismay among cotton planters as formerly. A few doses of Paris green destroy this once dreaded invader. Exact scientific investigation of the fungus diseases of the plant is rapidly casting a flood of light upon what were but recently hidden mysteries.

[In the accompanying illustrations, Fig. 1 presents a plant of the old "Peeler" cotton; Fig. 2 shows the lint attached to the seed of the "Dixon" variety; and Fig. 3 of the "W. A. Cook"; Fig. 4 represents the modern development in the "Peerless" variety; Fig. 5 presents a view of the old time screw and gin house with horse-power and lint-room attachments, engraved after a photo of the last structure of this kind in Northern Alabama; in Fig. 6 is seen the old "Scooter" stock made on the plantation; in Fig. 7 the "Adjustable Scooter" stock with "Terrill Heel Scrape."]

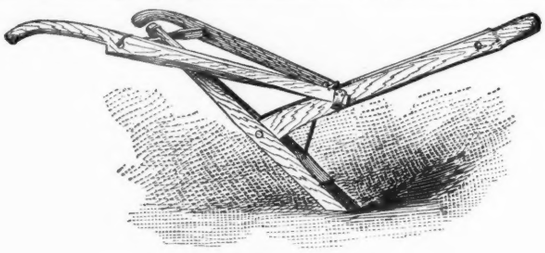


FIG. 6. OLD SCOOTER PLOW STOCK.

Results of Corn Experiments.—Medium maturing varieties average the largest yield of corn, the late sorts next, and the early varieties smallest. Horse manure is better than that of cattle for corn. Plants upon thoroughly-prepared land show the effects of drought much less than upon other plats. Two, three and four grains in the hill give the same yield. Shallow tillage gives a greater yield than deep culture.

HAVING TOO MANY IRONS IN THE FIRE.

WEBB DONNELL, MAINE.

Calling at the farm of a resident in one of the towns in central Maine recently and, while much interested at the evident signs of good farming that were everywhere apparent, I could not help being impressed with the idea that the farmer was making a vital mistake in the course he is following.

The farm was taken in a run-down condition, with buildings small and poor, and fields so poor that they only yielded some twenty-five tons of hay. At the present time the place cuts about one hundred and twenty-five tons of first-class hay. The fields are a delight to the eye in their fertility and smoothness. The barn has been enlarged to probably four times its former size, with comfortable and convenient quarters for about thirty to forty hogs and pigs, twenty cows, and eight or ten horses. A silo of eighty tons capacity was put in last year. Butter is made from the herd of grade and full-blood Jerseys, which sells at quite an advance on market rates. A large orchard has been planted, which calls for a great expenditure of care and time. Quite a large area is sowed to grain which, with the other crops that are raised, calls for a still further expenditure of labor. A sawmill near at hand has been leased, and business is being carried on here. A beginning has been made in raising heavy draft horses, by crossing a pure-bred Percheron on heavy mares. I found the proprietor in a very gloomy frame of mind, but hard at work. He had about come to the conclusion that farming does not pay—that he had to work like a slave, but received nothing for it. Even as he spoke, however, he would sandwich in the remark, as the conversation turned to various things, that he intended soon to build a new barn, and go into sheep-raising, or that he should soon build another silo. It was easy to understand why the man was discouraged. I wonder that he did not see it himself. He has too many irons in the fire, and is trying to do too much on a small capital. His dairy product must pay well, but every cent that comes from it as profit is put into some new scheme, or spent in enlarging an old one. This keeps the farmer cramped for money all the time, and also keeps him worked to the verge of desperation. There is something very attractive about doing business on a large scale, and it may be profitable in certain cases where capital is abundant so that advantage can be taken in buying and selling,

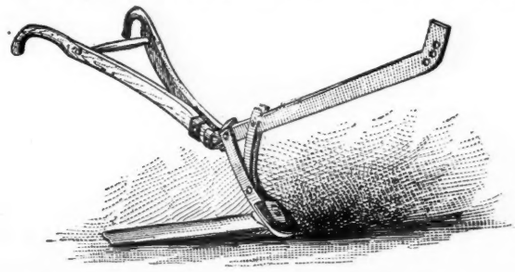


FIG. 7. ADJUSTABLE SCOOTER AND TERRILL HEEL SCRAPE.

but it is simply suicide for the average farmer, of limited means, to spread himself all over a four-hundred-acre farm here in the East.

The man of whom I write could probably make a good thing by dairying if he would attend to that solely, and he would moreover then have time to breathe and to inquire of himself whether it pays to make a beast of burden of one's self through life, getting only a living out of it, simply for the sake of doing a large business. He would much better mark out a particular line of work for which his farm is suited, and which he knows will pay a fair profit, and let his work all count for something. The merchant who, with limited means, tries to run a dry goods store, a grocery stand, a book store, and a boot and shoe emporium, usually goes into bankruptcy. Farming will stand a pretty serious kind of mismanagement, and still give a family a living, such as it is, but the business won't admit too much foolishness. The man who tries to carry on sheep raising, horse raising, orcharding, hog raising, cattle raising, dairying, and the growing of field crops, in addition to various outside schemes of money making, attempting to do a large part of the actual work by employing his own waking hours and those of his wife and children, is making a serious mistake. He may keep from going under with all his schemes, and in some cases may even increase the value of his stock, farm, and buildings, but he does it at the expense of his own and his family's well-being. No man has a right, unless he is peculiarly situated so that he is forced by necessity, to work to such an extent as to deprive himself of so many of the civilizing enjoyments of life, much less has he the right to deprive his family of them.

Of all people in the world the farmer and his family ought to lead comfortable lives, but a good many come far short of it, and too often through their own folly. They either farm ignorantly, or are striving all the time to do more than their capital, or their strength, will admit. It would be a good deal better in such cases as the last mentioned to take in some of the sail and pay more attention to the steering apparatus, so that the craft won't "wobble" about so, and thus lose headway, to use a figurative expression. Attention to details is a matter of very great importance in agriculture as well as elsewhere. and this cannot be given when one has too many irons in the fire.

WINTER DAIRY HINTS.

GEORGE E. NEWELL, NEW YORK.

The housewife who expects to make butter this winter from milk and cream set in the kitchen pantry, will not have any better "luck" than heretofore, in securing a good salable article. If one has not an especial milk and butter room for winter use, it will pay to add such an apartment to the dwelling, even though the quantity of milk is not large. No great outlay is necessary, but the setting aside of some room in the house for this purpose is generally all that is requisite. It is imperative that the atmosphere of the kitchen should have no access to the dairy room. It is safe to say that in two-thirds of the farmhouses throughout the land, where winter butter-making is practiced on a small scale, this vital point is utterly ignored. In seeking kitchen warmth, kitchen odors are admitted, and the pans of milk resting on shelves in the pantry, or even above the cooking range, are repeatedly charged with the impurities of the atmosphere. This is one of the greatest drawbacks to successful winter butter-making, but better knowledge of the subject should reform the bad practice. The room in which the milk is to be set for butter-making purposes should be ventilated by some aperture in the ceiling, and the temperature should not be subject to extremes of heat and cold. From 50° to 60° is a good temperature. The milk room should be so entirely separate from the living apartments that no vitiated air can enter it. If ensilage or roots are fed to the cows, the milk should be aerated as soon as drawn, to expel the foreign odor. In striving to have the cows comfortable, do not make the stable so close and warm that the animals will become lethargic, and lose their appetites. The vitiated air of a close stable will surely taint the milk. The health of consumers is threatened by the use of such diseased milk, and it will also impart its bad character to butter and cheese. Do not have the drop in the floor at the rear of the cows too close to their heels. A cramped position invites abortion, and is otherwise detrimental to the health of the animal. Supply milch cows in winter with bedding of either shavings or straw, else their food will not have its full nourishing effect.

Some dairymen place a high value on cornmeal for milch cows in winter, but it is better to feed with caution. The most successful dairymen do not feed cornmeal largely, as it is an expensive diet, and produces more beef fat than milk. Where a moderate quantity of meal is fed with hay, and the cows are regularly milked, the fattening propensity of the grain is counteracted. There is no question but that cornmeal makes an excellent quality of milk, as it does beef or pork, and when fed to milch cows in winter, it should be given in connection with bran shorts, or some other nitrogenous diet.

Sometimes the cream gets frothy, swells in the churn, and refuses to granulate into butter. There are many causes for this, but generally a higher temperature on the cream, or the removal of a portion of it from the churn, will facilitate granulation. When an excessive quantity of cream has been placed in the churn, there is no chance for the mass to be broken by concussion, and the liquid becomes gaseous. In winter the churning temperature should not exceed 64°, unless the cream it very obstinate. The milk from farrow cows, or from cows a long time in milk, will furnish cream that is slow about yielding butter. A small proportion of new milch animals in a winter dairy herd, will generally cause the butter to come readily at the normal temperature.

Any dairyman who has ever examined the filth that a cream separator purges from milk, ought to be seriously impressed with the necessity of a thorough straining of the product. Especially is this applicable in winter, when more dirt is liable to get into the fluid, through stable confinement of cows, than when the animals are grazing in the field. The good texture of butter counts for nothing when there is present a bad, unpalatable flavor. The hired help must be made to be cleanly about milking. Always strain the milk through a thick cloth strainer. We have heard of heavy flannel being used, not only for straining milk, but for cream. There is often a difference of ten cents a pound, or more, between the price of creamery and average dairy butter. There is no such discrepancy in price between the creamery article and the product of those dairies which follow correct methods of manufacture.

KEEP THE SOW BY HERSELF.

For a week or two before farrowing a sow should be kept by herself, else others will root her around when she is so heavy, and it may result in some injury to herself or her pigs. Give her a clean, dry and warm pen, where the pigs will not get chilled through, or frozen if they come in the night, or while no one is near. For a bed nothing is equal to cut straw, hay or stalks. Leaves are also excellent, but uncut straw or stalks should be avoided, as the young pigs are quite liable to become entangled in it and not to find the dam. The sow must be kept quiet, with nothing to annoy her, especially while she is farrowing. When she has come through all right give her two or three quarts of warm milk or water, in which is a little feed. Avoid giving cold water or feed, and do not expose her in any way to the cold air. If the pigs are found chilled, they may often be revived by putting them in a tub of water as warm as a person can bear his hand in. See that they all have enough to eat, and keep the sow and pigs by themselves so that they may be fed extra. It will not pay to let either get thin and poor.

ALWAYS.

Always believe in farming so long as it pays.

Always blanket the warm horse standing in the wind.

Always milk the cows regularly, kindly, and with dispatch.

Always have a snowplow ready when the heavy snows come.

Always count your chickens after the period of incubation is passed.

Always think twice before the boy is set to a task you would not do yourself.

Always keep cellars cool—as near 34° as possible—in which roots are stored.

Always prepare for the spring work during the comparative leisure of winter.

Always clean the mud from your horses, when you get home, and rub them dry.

Always go to the barns at night, just before going to bed, to see that the stock is all right.

Always keep the fences and gates in order, and have a supply of posts ready in the shop.

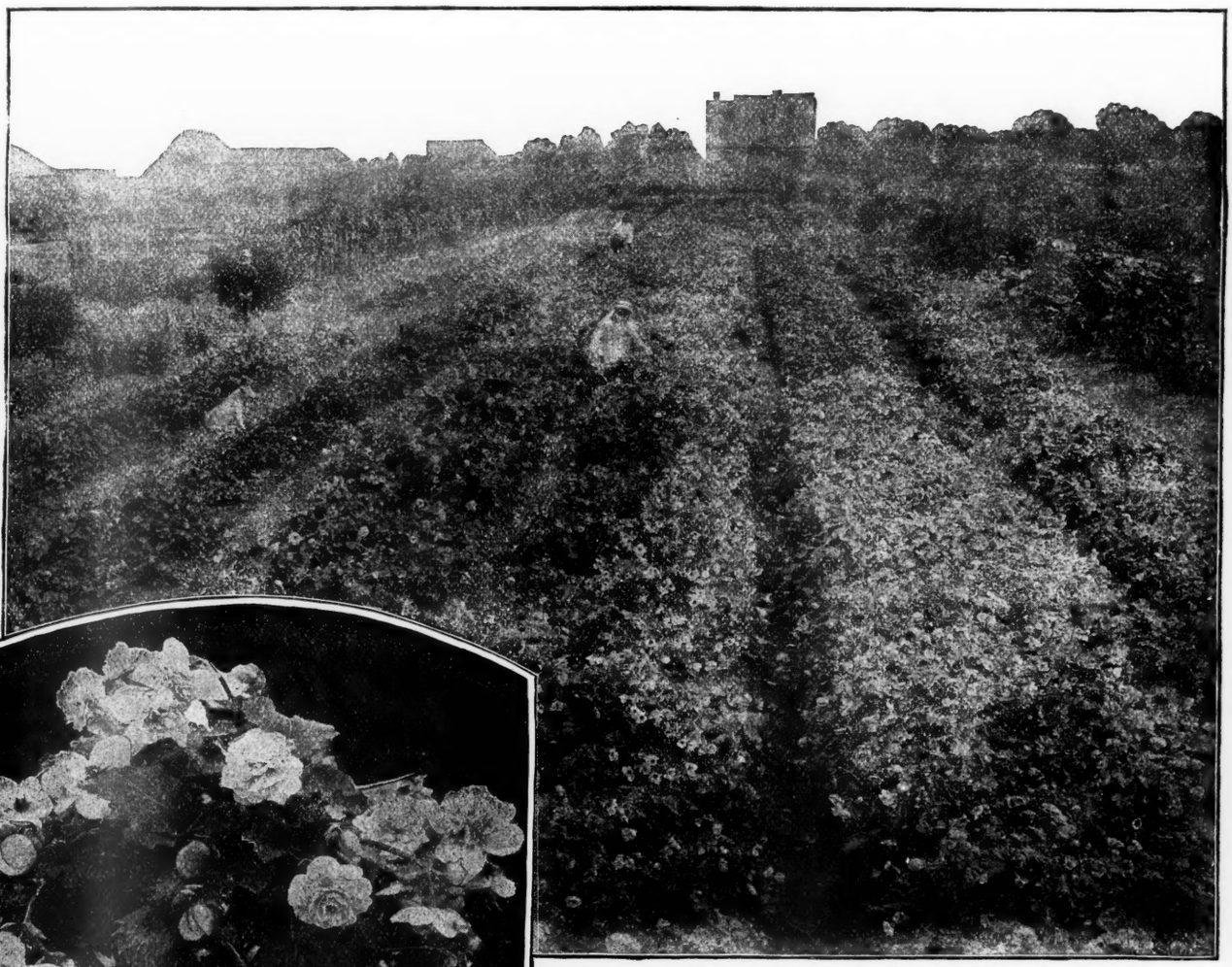
Always select the most vigorous and well ripened shoots for cions, after which pack in bundles and store in the cellar.

Always keep posted about the work of the month, and read the agricultural papers, not forgetting the advertisements of implements and seeds.

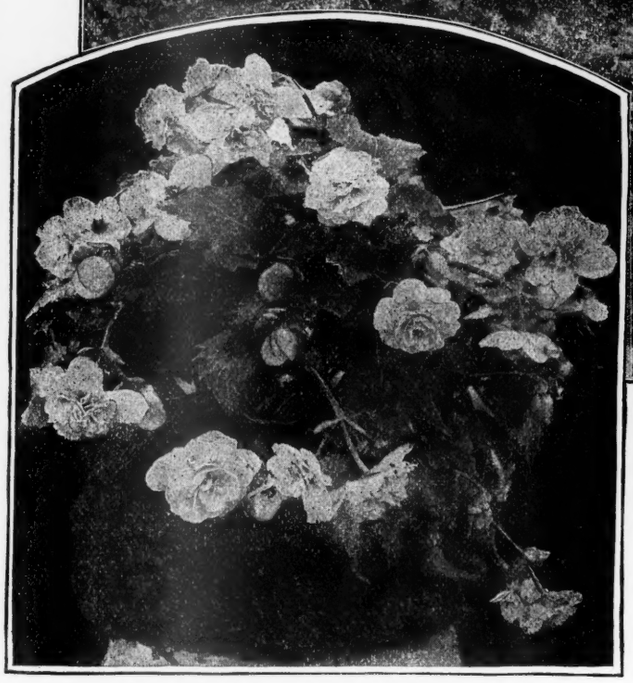
TUBEROUS-ROOTED BEGONIAS.

C. H. ALLEN, NEW YORK.

There is no longer any doubt as to whether tuberous begonias can be made useful in this country as bedding plants, the general impression having been that our rare atmosphere, high winds, and burning sun would destroy these apparently delicate forms. But recent experiments in growing tuberous begonias in the open ground have resulted in wonderful success. Formerly it has been the common idea, even by professional florists, that all begonias must be planted in shady places. This has been proved to be a mistake, and especially so with the tuberous sorts. This beautiful and very useful class of plants can, with little trouble, be grown by any one having even a very small garden, providing it is an open, sunny spot, as these begonias like plenty of sunlight, and will do much better in every way, make larger, finer plants, and the flowers will be more intense in their coloring, the petals stiffer, and better able to withstand the summer rains than if grown in the shade. For bedding purposes they are more desirable even than geraniums, for, unlike the latter, a heavy shower does not injure the flowers, but rather seems to brighten and increase their luxuriance. The past summer I saw a bed of these begonias, containing over twenty thousand plants, all grown from seed, no two alike, yet all the colors blending harmoniously, and producing one of the most gorgeous effects of plant life imaginable. Tuberous begonias thrive best in a light, sandy loam, liberally enriched with well decomposed stable manure, cow manure if obtainable. If grown from seed, this should be sown about February 1st in shallow boxes, using one part sharp sand, and one part loam; the seed should be sown very thinly and very lightly covered, not more than one-sixteenth of an inch. The top of the soil, after the seed is covered, should be one-half inch from the top of the box, this will allow the use of a pane of glass to cover the box, which will keep the soil moist. Never allow the soil to become dry, but do not keep it soggy, as this will injure the young plants.



FIELD OF TUBEROUS BEGONIAS.



DOUBLE FLOWERING BEGONIA PLANT.

After the young plants have made their second leaves, transplant them in boxes not over two inches deep; thumb pots can be used if preferred. The soil should be one part sand, and two parts good, rich loam, well sifted. Bore a number of holes in the bottom of the box to secure good drainage. A good plan for the amateur is to procure the tubers of the seedman. In the latitude of New York city, these may be planted in the open ground, May 20th, about one foot apart each way; or they may be started earlier inside in pots. They will commence flowering early in July, and continue until frost cuts them to the ground; then take them up and store away in dry sand in a warm, moderately, dry spot until the following spring. [Our illustration herewith, engraved after a photograph, presents an excellent perspective view of Mr. Thomas Griffin's begonias, mentioned above.]

Immature Seed.—In recent experiments with tomatoes, plants from green seeds ripened fruit ten days in advance of those from mature seed. It is still a question how far from maturity the seeds should be harvested to give the best results.

FIFTY YEARS AMONG THE BERRIES.

A. S. FULLER.

Strawberries.—In Vol. 1 of the AMERICAN AGRICULTURIST, 1842, Mr. Nicholas Longworth, of Cincinnati, gives an account of his supposed discovery of the sex in the strawberry. This opened a discussion, which waxed hot for the next decade, among the great lights in horticultural matters of fifty years ago. Personal opinions remained about the same when the contest closed, but the many who had read the essays in question, became interested in strawberry culture, and hundreds of persons began to cultivate this fruit, who had never attempted it before. Unfortunately, the old idea that a thing must come from abroad, to be of much value, prevailed among our nurserymen and amateur cultivators of fruits, and all the noted European varieties of the strawberry were imported, year after year, only to fail when planted outside of private gardens, or nurserymen's experimental grounds.

The first American variety to attract any considerable attention, was the Hovey, which appeared in 1834, but being a pistillate and barren, in the absence of a staminate or bisexual variety, failures to produce a crop of fruit were more frequent than successes, because few cultivators knew its needs in the way of cultivation and fertilization. But it was a grand berry, for its day, and indicated the possibilities of the future, from our native species of the strawberry. The numerous varieties raised by Burr, McAvoy, and others, followed, but for the want of the efficient aid of reporters and printers' ink, they remained almost unknown, outside of the localities where produced, and nearly, or quite, thirty years after the Hovey and its compeers had been disseminated, our markets were still mainly supplied with such varieties as the little Scotch Runner, and Crimson Cone, raised by farmers in the suburbs of our larger cities, and marketed in the most primitive kind of baskets.

Then there came a change, and a few larger varieties were exhibited. Peabody, Wilson, Austin, and *Triomphe de Gand* were occasionally shown and talked about, but none of these had been either widely distributed or cultivated, up to 1860. In that year, on June 16th, the writer exhibited, at a meeting of the Farmers' Club, of the American Institute, one hundred and five distinct varieties, all raised from seed sown in the fall of 1858. This exhibition, with the reports of committees visiting my grounds, probably had its influence in advertising American varieties of the strawberry. Two years later, three of the varieties were distributed among subscribers of The New York *Tribune*, to the extent of 450,000 plants, at a cost of $3,000 for postage. In June, 1862, a free exhibition of strawberries was held at the rooms of THE AMERICAN AGRICULTURIST, then at 41 Park Row, where thousands of visitors saw, for the first time, what we now consider "big berries," and probably every one of them, who owned a rod of land, resolved to try his hand at the cultivation of this fruit. A year later (June 18th), Mr. Seth Boyden exhibited, at the same place, his Seedling No. 10, afterwards named "Agriculturist," probably the largest strawberry ever seen in this country up to that time. The entire stock was purchased and distributed, free, among the subscribers of this magazine. With the advent of this variety, the position of American varieties became established, and their cultivation has been so rapidly extended since, that every city, village, and hamlet throughout our entire country, is now well supplied with this fruit in its season.

Raspberries. — The history of raspberry culture in this country is almost a repetition of that of the strawberry, except that we cannot claim any great advance in the way of new and improved varieties. All the early cultivators of this fruit looked to Europe for their choice varieties, and, although continually disappointed, they persistently ignored the American species, until within the past two or three decades. The late Dr. Brincklé, of Philadelphia, and Charles Arnold, of Canada, succeeded in producing many hydrids between native and foreign species, but these have all disappeared, with, perhaps, the bare exception of Brincklé's Orange, and this is only valuable as an amateur's garden pet. The Hudson River Antwerp, which, up to twenty-five years ago, was about the only red raspberry seen in the New York markets, has disappeared, and the formerly unappreciated native red raspberry has taken its place. But we cannot say that the native varieties that have driven out the foreign ones are really new productions, for all, or the greater part, have been found growing wild, and transplanted to gardens, where they have shown the results of cultivation. The Wilmington, Turner, Philadelphia, Shaffer's Colossal, Cuthbert, and its sport, Golden Queen, are but wildings, though none the less valuable on account of their humble origin. Among the black raspberries we have only selected and cultivated native varieties, and there are, no doubt, many others equally as good, to be found in our forests and fields, for this species is common from Washington, on the Pacific, to Florida, on the Atlantic, and thence northward, to Maine and the Canadas. The ever-bearing black raspberry, so often introduced as new, and under various names, is described in Vol. I, p. 5, of the AMERICAN AGRICULTURIST, 1842, and there we are informed that it had been cultivated since 1832, or sixty years ago. There are several other somewhat noted varieties, that have held their own against all competitors for fully fifty years, and bid fair to remain with us for another half century, and perhaps longer.

Blackberries.—With this fruit, we have accepted what nature has given us, bestowing names upon the wild varieties picked up here and there in hedgerows and fencecorners. The Dorchester, Lawton, Wilson, and Kittatinny, and a score of others equally well known, have the same accidental origin, and these, and perhaps better sorts, may have been gathered and dried by the Indians long before Columbus discovered America. The skillful horticulturist of the future may find here an unoccupied field in which to exercise his talent.

Currants and Gooseberries.—With these fruits very little progress has been made, further than that we have become better acquainted with the best European varieties, like the Cherry and White Grape, and also learned the worthlessness of the foreign varieties of the gooseberry for cultivation in this country. Our native gooseberries are small, but of fair quality, and there is certainly room for improvement. Of other native small fruits, like the juneberry, huckleberry, and cranberry, no new varieties of special merit have been raised.

Progress in Small Fruit Culture.—Taking small fruit culture as a whole, we have made most wonderful progress during the past three decades, not so much in the production of new and improved varieties, as in the extension of the cultivation of the old and most valuable. This extension is due, in a great measure, to the dissemination of practical information in regard to the needs of such fruits, not only through exhaustive treatises on the subject, but through the columns of the agricultural and horticultural journals, aided by the entire press of the country, for there has been no jealousy in this matter, all contributing nobly to help the good work, and make the small fruits so plentiful that the poor, as well as the rich, might enjoy what is no longer a luxury, but a necessity.

MODERN GREENHOUSE PLANTS.

WM. FALCONER.

With the changes in the shape, manner of building, ventilating, and heating of greenhouses, the kinds of plants grown in them have also changed. In former years, we grew in our greenhouses just what the English people grew in theirs,—Camellia, Orange, Oleander, Tremandra, Protea, Statice, Boronia, Daphne, Callistemon, Aphelexis, Acacia, Indian Rhododendrons, and similar kinds with, of course, Gesneras, Fuchsias, and Pelargoniums. But nowadays we have become discriminating, and lean more to striking foliage plants as palms, pitcher plants, screwpines, Alocasias, Dracænas, Crotons, rubber, and other plants, that are both attractive in the greenhouse, and serviceable for table or house decoration. We give little heed to Australian hard wooded plants. In the way of flowers, we lean for support on such substantial material as roses, carnations, bouvardias, violets, and orchids.

The varieties of greenhouse plants have improved vastly over what were grown thirty or more years ago. We have now blue Chinese primroses, giant Persian Cyclamen, double Cinerarias, spotted and marbled Gloxinias, Herbaceous Calceolarias that need no stakes, and Amaryllises of perfect form and uncommon brilliance, all within this period. Fifty years ago tropical orchids were almost unknown in our gardens. *Phaius grandifolius* from China, *Oncidium flexuosum* from Brazil, and *Cattleya Mossiæ* from Venezuela were the earliest introductions, and these were brought from England. From that time on, however, they gradually became more popular, till now there are millions of them in cultivation in this country, and we are yearly adding to them by importations from European gardens, introductions from their native wilds, and home propagation. Some of our florists carry $5,000 to $125,000 worth in stock, and private collections range from $100 to $250,000. Mr. F. L. Ames's collection at North Easton, near Boston, is said to be worth more than the last named sum. Even twenty-five years ago orchid flowers were unknown in the market, but nowadays, they are a leading feature in our principal florists' establishments.

ANEMONES.

F. PARK, NEW YORK.

In search for beautiful flowers we often overlook many kinds, because they are common, which yet have but few, if any, equals in the garden. Wild flowers, charming in their native haunts, are equally so in the garden. Cultivation rarely detracts from any living form; on the contrary it adds vigor without destroying the gracefulness so conspicuous in many of our native plants. The genus *Anemone*, is a large and varied one, containing more than seventy-five species, widely distributed, and as varied in character, and season of flowering. Our native wood anemone (*A. nemorosa*), is one of the earliest flowers of May, and in congenial situations fairly carpets the woods with its delicate foliage, spangled with flowers of the most delicate tints and pleasing forms. This plant is of easy culture, and, if grown in rich leaf mold, in a shaded situation, will come up in the garden year after year, with out any attention after the first planting. The only care necessary is not to allow it to dry up. *Anemone Pennsylvanica* is the most showy of our native species, and is a beautiful garden plant, succeeding in any good soil, and always giving a profusion of bloom. Closely allied to and, in fact, only a sub-genus of the anemone, is the *Hepatica*, commonly called "liverleaf," or squirrel cups," a flower which challenges the trailing arbutus to bloom first in the spring. This in the single wild state is very showy, and well worth cultivating, and, in the double varieties it is one of the most showy of our indigenous spring flowers.

FIG. 1. ANEMONE FULGENS.

FIG. 2. ANEMONE JAPONICA.

A. Japonica, a hardy herbaceous species, is, without question, the most useful of the species; it is an autumn bloomer, and seldom expands its flowers before the first of October. The flowers of the species are pinkish, or rather purplish red, very large, but somewhat loose in appearance. In the garden they produce a fine effect and will stand considerable frost without injury. Of this species there is a florist's variety, Honorine Jobert, which is unequaled in beauty by any garden plant. The flowers are white, large, regular and even, with a clear yellow center; it is of a taller growth than the species, and for a mass in the flower garden is unsurpassed for autumn decoration. The foliage is very ornamental and the flowers retain their beauty far into the autumn. The anemone listed in bulb catalogues, and the one that has attained the dignity of a florist's flower, is *A. coronaria* and its hybrids. The flowers are very variable in color, being blue, red, pink, white, scarlet, purple and striped, and of both double and single forms. The roots are small, knotty tubers of most unpromising appearance. In France and Holland, where they are grown in immense quantities, the fields present a mass of bloom the entire winter. None of the varieties will survive our winters in the open ground, but do well if covered with a frame.

Anemone fulgens, is one of the finest forms of the genus. Its color is of the most intense dazzling scarlet that it is possible to conceive. As it is one of the earliest flowers of the year, and so exceedingly brilliant withal, it deserves a place in every garden. The double-flowered types, or French anemones, have something of the appearance in form of a small, double hollyhock, with the same vivid colors of the single forms. The chrysanthemum-flowered form is another of doubles of considerable and peculiar interest. Like all other classes of florists' flowers, variety names are given to such as have special merit, either for form, color, or unusual markings. This increases

FIG. 3. TYPES OF ANEMONE CORONARIA.

the price of a given variety, without materially enhancing its value, as all are so beautiful that to select one more beautiful than another would be a difficult task. And, after all, it is the flower and not the name we want; and, as we cannot get a poor one, the

extra price the name entails might better be given for an additional quantity of bulbs, or for extra care and attention in cultivation.

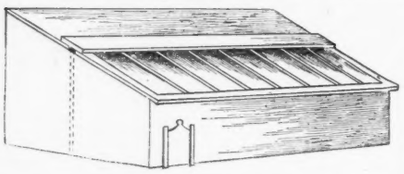
All the hardy species of anemones fill out to perfection some little, cozy corner or nook in the garden, speaking affectionately to us in springtime in wildwood language; and the more tender kinds amply repay for the care required to grow them successfully. When the flowers have faded and the foliage turns yellow, the tubers may be taken up and stored in a cool place until the next planting season. They may also be kept over winter for spring planting. [Our engraving Fig. 1 shows a clump of *Anemone fulgens;* Fig. 2 a flowering spray of *A. Japonica*, and Fig. 3 some of the best types of *A. coronaria.*]

COOPS FOR COOL WEATHER.

NANNIE CABELL, VIRGINIA.

I raise and keep fowls on a small scale, and always wait until several hens are ready to sit at the same time and then sit them so that all hatch together. When the chicks are hatched I give about thirty to a hen. These she can easily care for in the coops used. Some say that it is more expensive rearing chicks this way than in an artificial brooder. But a hen is the natural brooder and gives far less trouble. When the cold nights come I can sleep comfortably, knowing that the hen will supply natural and continued heat; whereas, on the other hand, an oil lamp might go out. Then there is no trouble about leg weakness complained of by those using artificial brooders. That my plan is a practical one is proved by the fact that in the three or four winters I have been using the present kind of coop I have not lost a half dozen chicks, except from hawks and cats occasionally.

The coop referred to and illustrated is made after the order of what gardeners call a "cold-frame." One-half of it has a plank roof, in which part the hen is kept confined and the other part has a sliding glazed sash made like a pit sash. In this glass room I keep a continual supply of food and water, this latter in sardine boxes, with the lid cut on three sides and slightly tilted back so the little chicks can get their heads in to drink, but cannot step in. The food consists of bread crumbs, little bits of meat, some corn meal, and any kinds of vegetables there may be left from dinner, wheat screenings, etc. After the first four or five days I pull back the narrow sliding door at the bottom part in front, and let the little chicks run in and out to suit themselves, unless it is very cold. This seems necessary, for the first thing they always do is to rush to a pile of wood ashes near by and pick up bits of charcoal or bit of brick. When the chicks are about three or four weeks old the hens are let out on sunny days, and they all have a happy time. The dimensions of the coops are about five feet long, two and a half feet wide, two feet high at the back, sloping to one foot in front. Between the division for the glass sash and the plank roof there is a space left wide enough for a slatted door which slides in and out and keeps the hen from the feeding or glass room, but lets the chicks go back and forth freely. Shallow wooden troughs are nailed around the sides, in which is put the feed so that it need not be trampled on. Over this open space a plank is laid to keep out the rain or sun. Nails driven in at the lower side of the roof hold the plank from sliding off. A plank floor is made a little smaller than the inside of the coop, so that when the rain runs down the sides of the coop it will run on the ground and not on the floor. When dry leaves are at hand I change the bedding in the sleeping room whenever it needs it. This bedding of leaves keeps the chickens warm and clean. Before putting the little chicks with the mother hen I grease each little head slightly with kerosene oil to destroy any lice that may be on them, or prevent any from coming. Since I have adopted this plan I never have gapes among the chickens. If it is quite cold I put the hen and chicks in a box and set this in a room where there is fire, until the little things are strong enough to run well, which is generally in one or two days.

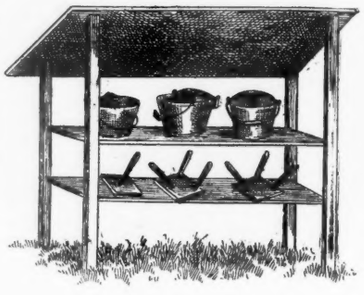


MODEL CHICKEN COOP.

I keep my chicks in the garden until they are three or four weeks old. There is always something green growing which helps the chicks, but they do not hurt the garden. If success is proof of the value of my coops I have the strongest kind. I live in Central Virginia about a hundred miles from Richmond, and find coops made of one-inch pine plank sufficiently warm.

MILKING YARD CONVENIENCES.

It requires but a little time to make a shelter like that shown in the accompanying sketch, furnished by Mr. L. D. Snook, and it certainly provides a very neat and desirable place in which to set the milk until all the cows are milked. The lower shelf makes a good receptacle for the milking-stools, and, by the way, milking-stools ought to be made for the purpose intended, and not by the utilization of some old box, keg, or pail, as many do, for milking is not such a pleasant task that the milker should have a tortuous seat while performing the operation. This shelter keeps the rain from the milk, and out of danger from being upset by the cows. The stools are kept dry, and neatness of the entire surroundings, convenience, and comfort to the milker, are the result.

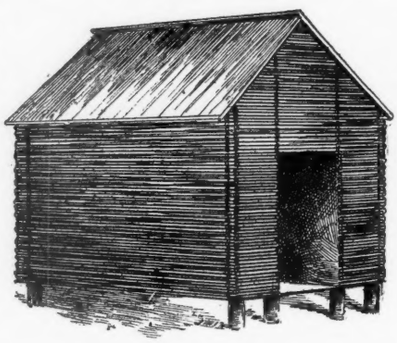


SHELTER FOR MILKING TOOLS.

CONVENIENT CORN CRIBS.

JOHN M. STAHL, ILLINOIS.

Where timber is not scarce, the pole crib will be found the most economical. In such a pen, if properly made, corn will keep as well as in any crib or house that can be devised. The pen should not be more than eight feet wide, and two feet less width is yet better. The length is determined by the desired capacity, or the length of the poles to be had. The poles should not be large, and notched only deep enough to prevent their rolling, and to bring them near enough together to prevent the corn rolling out; for if the poles are large, or brought close together, the circulation of air will not be free enough. Cribs are commonly made too close; although the cracks between the poles be two inches wide, not enough rain to do any appreciable damage will beat in, because the poles will project out over the cracks. A foundation may be made by laying large logs on the ground; but this is objectionable, as the rats will burrow under the logs. A better foundation is made by setting blocks in the ground, below the line of frost, and high enough to bring the floor of the crib at least eighteen inches above the ground, so that the corn may not absorb moisture from beneath, and that the cats and terrier may have a chance at the rats and mice. However, the rats will not infest a crib under which there is plenty of light. Make the crib on high ground with enough slope to drain well, taking care that the foundation is level. The floor may be made of puncheons. Trim off the slivers from the upper side; otherwise it will be a difficult matter to shovel out the corn. A doorway is made by cutting through three or four of the lower poles, nailing a board against their ends to hold them in place. A door is hinged to the outside of the crib, and as the corn is thrown in, boards are placed inside the crib, across the opening. If they pass beyond the opening only an inch at each end, they can be removed easily when it is desired to take out the corn. The roof is made of clapboards or of common lumber. If boards are used, they should be just long enough to reach across the crib, and the weights placed on them should be put on their ends. If the boards project, they will split in from the end to the point where they rest on the crib, It is better to weight than to nail the boards down, since they must be turned each year, to avoid warping.



A POLE CORN CRIB.

A pole pen can be made with a driveway in the middle, which can be used for a wagon or machinery shed most of the year. The cribs run up to the roof, and the driveway is roofed over into a

loft for the storage of hoes, forks, rakes, and other light tools. The winter months furnish opportune time for cutting and hauling the necessary timber for such a structure.

[Our illustration gives a good idea of a pole crib with a driveway through the center.]

GRAFTING THE NATIVE PLUM.

E. S. GOFF, WISCONSIN AGRICULTURAL EXPERIMENT STATION.

Top working the native plum on its own species is attended with little risk, when properly performed, provided the weather, for a time after the operation, proves favorable. But in the Northwest, where the first taste of spring is likely to be followed by a return of real winter, success, if I may judge from my own experience, is somewhat precarious.

It is considered important to perform the grafting before the buds of the stock have commenced to swell. As this occurs, with us, almost immediately after the frost is out of the ground, no time must be lost. But if, after the frost has left the ground, and the grafting has been performed, a period of dry freezing weather returns, the cions are liable to dry out to so great a degree that their power of absorbing moisture is nearly destroyed, and death results. In the spring of 1890, my success in top grafting the plum was excellent, but in that of 1891, in which the first spring days were followed by several days of severe and drying weather, my cions almost uniformly failed. Hereafter, I shall take the precaution to incase the entire cion in wax. It is quite possible that this might have saved my cions.

From my experience last spring in root grafting the native plum, I infer that it is wise to keep the grafts, after working them,

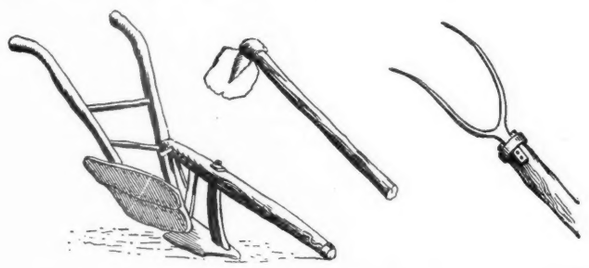


FIG. 1. OLD-TIME PLOW. FIG. 2. HOE. FIG. 3. PITCHFORK.

sufficiently moist, so that the buds are slightly swollen at the time of planting out. Heretofore I had supposed it better to keep them dry enough to prevent all swelling of the buds, but last spring I discovered, at the time of planting, that a portion of one box had been permitted to become damper, so that the buds on the cions were considerably started. A severe drouth followed the planting, and, to my surprise, almost every one of the root grafts, of which the cions had started, grew, while those planted drier were nearly a total failure.

The cions are likely to start during winter before they are worked, unless kept quite dry, and when this starting occurs, it is almost useless to work them. To prevent this, I follow Prof. Budd's method of packing the cions in dry leaves, and keeping them in the cellar. For this purpose, I have a quantity of leaves raked from the lawn, on some day when they are dry enough to blow readily. I then place these in a box, and inclose the cions in them, after which I weight the leaves down well, so that those in contact with the cions will neither gain nor lose moisture. Treated in this manner, the cions come out in spring precisely as they went in, entirely plump, but not in the least moistened by absorbed water.

Dairy Schools and Their Graduates.—Too many of our cheese factories are officered by incompetent managers. The school teachers are required to pass a certain examination before they are allowed to teach. Is it a greater hardship to ask that our butter and cheese makers who manipulate millions of dollars' worth of milk annually shall pass an examination as to their proficiency, and then secure to them fair living wages in return? The dairy, as a rule, needs better patronage and a more scientific and skillful factory and creamery management. What are our dairy schools for? Let our legislatures make these schools thorough, furnish them a full equipment of teachers and mechanism, with nominal tuition. Then it will be well to require the manager of a factory or creamery to be a graduate of one of these schools, and thus make them useful.

OLD-TIME FARMING TOOLS.

The man who goes into his field at the present day with his improved tools must fail to appreciate the disadvantages under which former generations of farmers labored. It is only here and there that a trace remains of the implements with which they

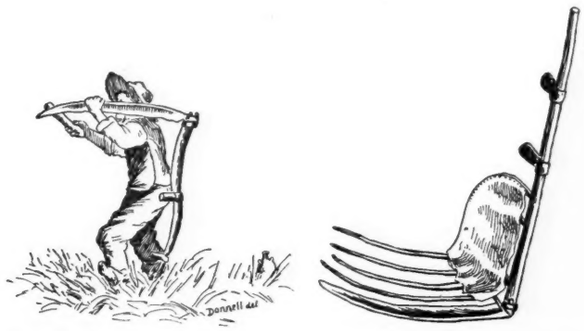


FIG. 4. WHETTING THE SCYTHE. FIG. 5. PRIMITIVE GRAIN CRADLE.

"worried" the ground. These illustrations have been drawn with an especial attempt at fidelity from implements which are, for the most part, peacefully reposing in out-of-the-way places on one of the oldest New England farms.

The plow, Fig. 1, has a wooden mold-board which does not extend forward to the cutter by some four inches. It is nearly covered by two thin sheets of iron. A broad, flat shoe, terminating in a "point" in front, forms the base of the plow. The hoe, Fig. 2, is a clumsy affair, with a round socket, into which the heavy handle was thrust. The pitchfork, Fig. 3, was similarly handled. For a scythe-snath a vigorous young sapling used to be chosen, and by proper arrangement of cords and poles was bent into the desired shape while still growing. The young tree remained standing until this form became fixed, when it was cut and fashioned. The heel of the scythe was fastened to the wood by a stout iron ring, or band, made firm by driving in several iron wedges, besides which pieces of wood and leather were commonly fitted into the interstices. This fastening was tightened occasionally when the mower approached a stone wall, where he could use a loose stone as a hammer with which to drive in the loosened wedges. The manner of whetting the scythe, or "wheeting," as some of the old residents called it, is shown in Fig. 4. The mower crouched under the blade, which rested with its edge upon his shoulder, and in this position sharpened his implement for the next 'bout. When the cradle replaced the sickle, it was regarded as a wonderful improvement, but a glance at Fig. 5 will show how far the improved implement was

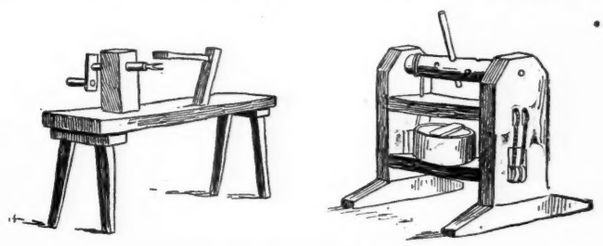


FIG. 6. OLD APPLE PARER. FIG. 7. CHEESE PRESS.

behind the self-binders of the present. The snath, like that of the scythe, was made from the stem of a sapling. An old apple-paring machine, Fig. 6, was made with a bench upon which the operator sat. The apple was placed upon the fork and a movable piece of wood, with a knife blade fitted in the end, was held upon the apple, being moved along the surface as the fruit was revolved. The old hand cheese press, Fig. 7, needs no explanation. Some of the early cart wheels were sawed entire from the end of an enormous log. The stone drags were perfectly flat on the bottom, not turned up in front, as at present. In general, it may be said that nearly all the tools of those early days were rude and unwieldy, but labor was cheap and the soil fertile. Will the "improved" implements with which we now conduct the business of husbandry appear as clumsy and inconvenient to our grandchildren as these old relics do to us? It is hardly reasonable to suppose that our inventors have yet attained perfection in agricultural appliances, and that the progressive spirit of the future will be less productive of inventive genius. Cotton will not be handpicked much longer.

HOUSEHOLD

The Young Mother's First Baby.

ELIZABETH ROBINSON SCOVIL.

The experienced mother of a family takes charge of a baby with the calm assurance that she knows exactly what ought to be done for it to enable it to grow and thrive as a healthy child should do. No doubts disturb her, because she has gone through the same process often before and has learned that babies are like plants, a judicious letting alone is good for them. Far removed from this tranquil state of mind are the feelings of the young mother when she assumes the charge of her first baby. She scents danger in every change of countenance in her treasure. If it rolls up its eyes she feels sure it is going into convulsions. If it sneezes she knows it is the beginning of a cold that will end in inflammation of the lungs. If it sleeps too long she fears it is a stupor that is the symptom of some disease of the brain. She worries so incessantly that the poor baby, who is a sensitive being, catches the infection and worries too.

What can be done to help these inexperienced girl-mothers who feel so keenly the burden of responsibility that has come upon them? There are a few general principles in the care of children that every woman should know, and then her common sense must adapt them to particular cases.

Babies must have proper food, suitable clothing, fresh air and plenty of sleep. Perhaps the most important of these is food. If the mother can nurse her child the problem is comparatively a simple one. She has only to avoid those dishes which she finds disagrees with it, and take nourishing food herself to keep up the supply of milk. She should drink a good deal of liquid, milk, cocoa, gruels, etc., and have a generous diet. The baby should be nursed every two hours at first, this interval being gradually increased until at three months old it is every three hours during the day and once or twice at night. Even a young baby can go for several hours at night without food, if it sleeps quietly. It should never be in bed with its mother; its own crib is a much safer and better place for it.

When a child has to be fed it is often difficult to find a food that will agree with it and then the mother can only patiently try one after another until the right one is found. In the country, where pure, fresh milk can be obtained, one-third milk and two-thirds water is a good mixture. The milk must be clean, drawn with clean hands from a cow whose udder has been washed. Eight tablespoonfuls is enough for an ordinary sized baby at one feeding. If this is not digested try two tablespoonfuls of cream, one of milk and five of water. Use very little sugar.

Should the baby's digestion still rebel, the milk may be sterilized by steaming in a lightly corked bottle for three-quarters of an hour, or peptonized by using some one of the preparations for peptonizing milk that can be obtained from a druggist. If these have to be discarded, some of the excellent artificial foods that are so widely advertised may answer the purpose. If the food smells sour when it is vomited, a tablespoonful of lime water will correct the difficulty. Sugar of milk may be used to sweeten the mixture, and it should never be made too sweet or given hotter than lukewarm, which is the temperature of the natural food. The quantity must be increased as the child grows older and shows a desire for more food. Oatmeal or barley gruel can then be added. Two nursing bottles should be used with plain rubber tops. These should be frequently renewed, and the bottles kept scrupulously clean. To do this rinse them in cold water as soon as emptied, wash them in warm water and scald with very hot water. Bread or solid food should not be given before the front teeth are cut.

The baby's wardrobe is the first thought of the young mother. If she can make up her mind to discard tight bands and long skirts she will make her baby more comfortable, and therefore more amiable. Many mothers have adopted the principle of the Gertrude suit in which the garments are cut in princess shape, or something like little wrappers. A modern outfit consists of three of these little slips, the two inner ones of cotton and wool flannel, one fastening in front, the other behind, one with sleeves, the other without. The overdress is of cream cashmere for a winter baby and nainsook or Victoria lawn for a summer one. The dresses can be finished with delicate feather stitching, or fine tucking. Elaborate embroideries have gone out of fashion. A few strips of flannel, five inches wide by twenty-four long, can be added for bands. These should be simply torn off, not hemmed, or finished in any way. They are only required for a few weeks, and should never be put on tight. Four dozen napkins should be provided. Some mothers prefer those cut on the bias to the square ones. A cheap canton flannel is a good material for them. Two or three wrappers made of outing flannel will be found a great comfort. Crocheted or knitted socks keep the feet warm and are indispensable where a pinning blanket is not used. Cream cashmere makes the most serviceable cloak and hood, and here, again, rows of feather stitching in silk is a pretty ornamentation.

Fresh air is just as indispensable to a baby as it is to a grown person. This does not mean that it is to be kept in a cold room, or exposed to a draught to toughen it. The thermometer in the nursery should never indicate a lower temperature than 65°. A screen can be placed around the crib, the baby warmly covered and the window opened a few inches two or three times a day. Or the window in the hall or adjoining room can be kept open to admit fresh air, which becomes warm before it reaches the baby. The child can be taken out of doors, properly dressed, in suitable weather and be benefited by the change.

All babies require a great deal of sleep, and if they are comfortable they will take it. They should not be disturbed more than twice in the night for food, even during the first weeks. As soon as possible this should be reduced to once, and after a time they will sleep from eleven to five or six without waking. Older children should have a nap in the morning and afternoon as long as they can be induced to take it, and when the habit is established a daily nap can be continued for a long time.

Let the young mother remember for her comfort that Nature intends babies to live, and with reasonable care the chances are altogether in their favor.

Making and Mending Winter Underwear.

KATHERINE B. JOHNSON.

Do not make the mistake of patching merino underwear with cloth. Either use the better parts of worn-out garments or of cotton hose. All parts that are worn thin, such as the knees and bodies of drawers and the elbows of vest sleeves, should have a generous-sized piece cut with rounded corners and cross-stitched finely with strong thread all around the edge, but without turning the same. Many a time, when hurriedly doing your week's mending the coming winter, you will feel grateful for this part of your work, as you can then quickly darn the worn place down to it. Narrow bias strips of fine cotton cloth are better for rebinding the necks than tape, and when sleeves are worn at the wrist buttonhole them closely with either knitting silk or worsted and then crochet a small scallop around the edge.

One of the faults in ladies' underwear consists in having too many gathers, thus making too much heat over the abdomen. An excellent way to remedy this is to obtain a pattern of a skirt yoke and use it not only on all skirts but on both woolen and muslin drawers. These yokes can be made from four to twelve inches in depth, and consequently are adapted to all the needs of lengthening down skirts from the wearing off at the edge, or other reasons. Skirts do not require to be cut with gores when using a yoke. Regulate the fullness so as to have little or none in front and most at the back. Flannel skirts cut in princess shape, either with or without sleeves, are an excellent style for children, but no one should wear more than two and those of soft and fine flannel rather than coarse and heavy. A convenient underwaist for children is made of any heavy cotton cloth, cut with one dart and an under-arm gore three inches below the waist line. Face it up to this depth, sew a button on each hip, at the bottom, for the stocking supporters, one at the center of both back and front for the under-drawers, and one at an equal distance from the center of both front and back, four in all, for the outside drawers. At the waist line sew four more for skirts. This does away with all superfluous waists.

Waists that are small can be ripped open at the center of the back, and, after carefully piecing out the lining, have a pointed strip of contrasting material inserted extending to the waist line. Have the front pieced in the same manner, and then covered with a vest of the material used in the back. Sleeves which are small at the top can have a V-shaped piece inserted, either plain or gored, of the contrasting material, and when short or worn at the wrist a puff with a narrow wristband below, or one of the many shaped cuffs worn, can be added.

In purchasing new material it is a wise policy to get as good as you possibly can. It costs no more for linings or the making of an all-wool dress, which will do good service two seasons and then cut over for a child, than it does for a half cotton one which will look faded and dowdy before the first season is half over.

Window Gardens in Winter.

MRS. M. L. PIKE.

This article is not for those who go to florists to fill their windows with expensive plants, but is intended to help the many women who dearly love flowers, but have little money to spend on them and not much time. Florists' advice is good, so far as it goes, but it rarely takes into account the inevitable lack of extreme attention where household cares are pressing. Now, there are many plants that will bear neglect, that is, that do not want fussing over, and, if watered well to-day, will stand over to-morrow without suffering. If your house is cold, paste little strips of white paper round the windows to keep out frost, and if a cold night comes, put sheets of newspaper between the flowers and the glass. Open doors will give air. If you burn oil instead of gas, so much the better for both you and your plants.

Before potting, wash the pots clean, and save every bit of broken crockery to place in the bottom for drainage. Get good, light soil, not clayey, and some well-rotted cow manure and you are ready to begin. Young geraniums, oxalis, dwarf nasturtium cuttings, ferns, not natives, dwarf petunias, vincas, and others are good for potting. Fuchsias, when out of bloom, should be put in the cellar with large geraniums, agapanthus, brugmansia, etc. Give a little water about once a fortnight. *Nicotiana affinis* is a grand plant to have. A July seedling will begin to blossom in January, and go on for months perfuming the house. Carnations may succeed, but after their first bloom, as a rule, they do not. Begonias are the great stand-by. The *B. rubra*, with its scarlet clusters, *B. Sandersoni*, laden with pink blosssms, the handsome *metallica*, and others, all are good as they will do where there is not much sun, and all are so easily grown from cuttings. If you have a *B. rex*, let it stand by itself; it resents crowding. Strong cuttings of ivy in the fall will climb over the window in spring. Thunbergias and maurandias are exquisite creepers for trailing over pots or baskets.

Wonder why florists' flowers do so well and ours look so miserable? They nourish their plants judiciously, and we either starve, or gorge them. If you can, be sure and get a day blooming cereus, a phyllocactus. It is superb! Keep the cactuses in a cool window, and water only about once a week, until mid January; then advance to the full light and keep damp, but not wet. After potting, leave for some days in the shade and cover at night with newspapers. Bring them in before you light all your fires. If you are short of pots, large tomato cans with a few holes bored in the bottom and painted, do well. Some of my best flowers grew in them last winter. If you have boxes instead of pots, don't crowd and put in too large plants. If you have abutilons, cannas, palms, ficus or other large plants, let them stand alone or in groups; they fill corners so handsomely. Be sure and have a Chinese primrose and a cyclamen for constant bloom, and if you can get it, an *Impatiens sultani* or Zanzibar balsam, never out of bloom, summer or winter.

Don't fuss too much, only keep off dead leaves and insects, and they will well repay you. None of the flowers named want a very warm room.

The pleasure of a few plants in bitter winter weather will gladden the wearied eyes, even if there is but foliage and few flowers.

A Painted Penwiper.

Take a piece of French gray cartridge paper six inches long and four and a half wide, fold it in the middle and shape it like the cover of the penwiper in the accompanying sketch; cut fine notches all around the edge, and on one side paint

A WRITING DESK ORNAMENT.

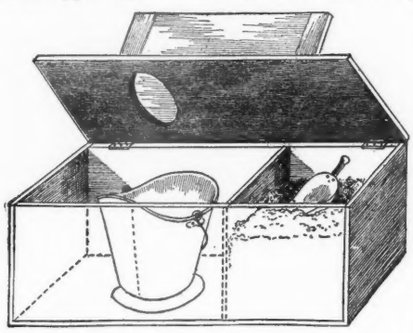
the pink rose and bud, green foliage and green and gold grasses with water colors. The inner leaves are of black flannel and chamois pinked around the edges; a green or a gold cord binds them inside the cover, passing out and in through four holes in the back, and is tied, as shown, and tipped with small tassels. Ribbon might take the place of the cord, and instead of the floral design a little landscape sketch in sepia would be pretty. Besides being useful, such penwipers make pretty little ornaments to hang by the writing desk.

A Farmhouse Convenience.

DR. GEORGE G. GROFF.

For women, children, and invalids, it is important, during cold and inclement weather, that some form of closet convenience be possessed within the house. It is possible to have a closet within doors, for use of invalids, women, and children, which with ordinary care will be inoffensive and harmless. It is suggested by Mr. J. C. Bayles and described by him in the Chicago Sanitary News, as follows:

"The body is a plain pine box. Its sides are not over fourteen inches high; its depth is eighteen inches (measuring from front to back), and its length about thirty inches. It is divided into two compartments, one 18x18 inches, and the other 18x12 inches. The larger of these compartments has no bottom; the smaller has a tight bottom. On top are two covers. The lower cover, hinged to the upper edge of the back, extends all the way



DEVICE FOR INDOOR USE.

across both compartments, In this is cut the seat over the center of the larger compartment. The upper cover is hinged to the lower one, and may be raised independently. It is made the size of the larger compartment only, both covers having a little overhang to facilitate lifting them. The material in and work on such a box will cost anywhere from $2 to $3, according to the amount of finish put on it by the carpenter. The receiving vessel is a galvanized iron coal-hod, as large as will stand in the larger compartment with the covers down. The smaller compartment is filled with dry earth, ashes, peat-dust, or whatever else is used as deodorizer, and a little hand-shovel or scoop is laid in. The closet is then ready for use, which should be preceded by throwing into the coal-hod as much of the dry material as is needed to cover its bottom an inch deep."

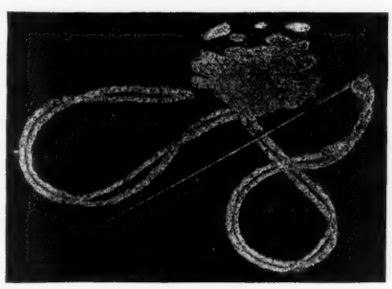
The best material to use is dry earth from the garden, of which a few barrels should be stored in the house during a dry time in the summer. Or, if anthracite coal is used, the sifted ashes from it will be excellent for the purpose. Sand and the ashes from bituminous coal are useless for this purpose.

A New Stitch that Saves Time.

MRS. C. S. WADY.

It was discouraging, to say the least! How four people (and two of them babies) could fill a mending basket quite so full of "to be repaired" hose, in so short a time, is an ever present mystery. And this time, of all others, when so much remained to be done, in preparation for our trip. But there they were, and to be done that evening. I darned patiently "over and under" for some time, when suddenly a new light dawned upon my mind, and I applied the inspiration on the next hole. The result was perfectly satisfactory, and I am anxious that other house-mothers should know it and profit by its advantages.

The stitch looks best on small holes, though it can be made to appear well on large ones. Begin at the right side, and run several rows up and down, to strengthen that part; then work up and down, pointing the needle, as shown in the illustration, until the opening is closed; two or three rows, as in the beginning, and it is done. No recrossing is necessary, unless the hole be very large, when a few rows "over and under" across



A STITCH FOR DARNING.

the middle will suffice. When the worker has reached that point this explanation will be clear. It can be done so quickly and neatly that I am sure it will recommend itself to the mothers whose baskets are as crowded as mine, and who have as little time and strength for it all.

Some Artistic Cushions.

C. TAYLOR.

A cushion eighteen inches square of white china silk has, a little to one side of the centre, a group of magnolia blossoms, leaves and buds, outlined by couching on a yellow silk cord with yellow filoselle; the principal veins in the leaves and shading of the flowers are outlined with the floss; the centre of the flowers are made with French knots of floss, while the background is covered with French darning, done with the floss. Around the edge is a frill of dainty cream lace, festooned with cord like that used in couching the flowers.

A large, round cushion has the top of dark red brocaded silk with rather large figures which are outlined with Japanese gilt thread. The bottom of this cushion is the same shade as the top. Around the edge is sewed a heavy gold cord with loops and ends.

For a third, use a square of brown denim the width of the goods; turn the dark side over on the light at each edge to a depth of about three inches, feather-stitch the edge of the darker strip to the lighter center on the inner edge with brown silk. This leaves a fifteen inch square of the lighter shade with a three inch border of the darker shade all around it. Cut some oak leaves from denim, place them to suit yourself, with the dark side up, on the lighter centre, buttonhole the leaves on and outline the veins with brown silk. Make the under side of denim with the dark side out.

A large square cushion is made of blue denim with a border of cluny lace three inches wide applied so that the points come over the seam which joins the upper and under parts, and across the centre is painted a branch of dogwood blossoms in their natural colors. The paint must be applied thick to produce a good effect.

A Beautiful Embroidered Apron.

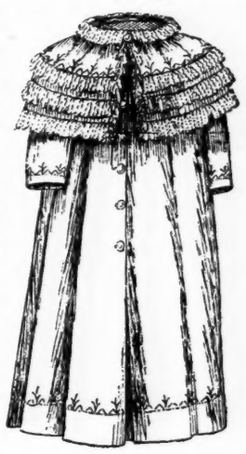
A yard and two-thirds of yard-wide embroidered muslin flouncing is required for the apron represented by the accompanying sketch. Nearly a third of a yard is cut from one end of the flouncing; the embroidered end of this strip is used for the bib, and from the remainder the plain, pointed girdle is cut. The larger piece is hemmed at the sides, and gathered and sewed to the girdle, first being cut down a little in front, to fit the point. The gathered bib is sewed in with the girdle seam, and tacked invisibly to the girdle above, as far as it goes. Ribbons trim the bib and girdle, as shown, and there is a long-looped ribbon bow at the back. For a stout person, the bow at the girdle point should be omitted. It would also be handsome without the bib, but is more dressy with it, especially over a plainly-made gown.

A DRESSY APRON.

The Baby's Cloak.

FRANCES H. PERRY.

This lovely little cloak for a baby is made of cream-white cashmere, is long and full, buttoned down the front, and has an overcape of the same, shirred on around the neck. The outlining at the sleeve hems and that at the bottom of the cloak is a row of chain stitch embroidery, in pure white silk. The fringe decoration of the cape is novel and beautiful, handmade, and requires explanation, after which it may be easily copied. Work an even row of chain stitch straight round the cape near the lower edge, and above that work two more rows, at regular distances, as shown. Take cream white split zephyr (an exact match for the shade of the cashmere, or there is no beauty in it), and crochet three rows of fluffy chain fringe, in loops, working into the rows of silk chain stitch, for heading, as follows: Fasten the wool, at one end of the lower row, with a fine hook; *chain two stitches closely, fourteen loosely, two closely again,* and work two single crochet into the lower side of the third stitch of the heading; repeat from star to star, and work two singles in the third stitch from that last used in the heading; repeat around the cape. If thinner fringe is liked, divide by four in the heading, and if longer increase the number of loosely-made chains in each loop.



A CLOAK OF CASHMERE.

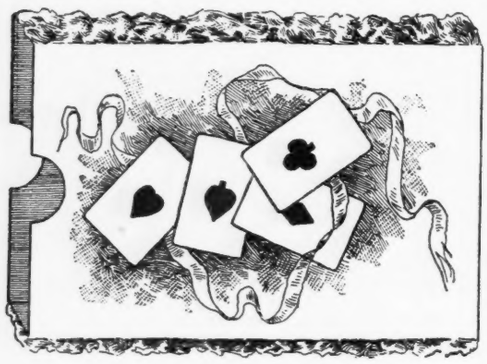
Work the three rows, as shown, and a similar

row up each front edge of the cape, and around the narrow neck band, working into a previously made row of silk chain stitch around the edges. Above the upper row of fringe work a row of embroidery, to match that on the sleeves; as illustrated, the pattern is only a row of points—five stitches, then turn—joining the heading on the upper side, and between each pair of points is a little branching spray. Crochet silk might be used both for the pattern and the fringe, if desired.

A cloak of this kind would be a welcome present to a busy mother, and a comfortable and beautiful garment for any baby.

A Case for Playing Cards.

When you buy a good pack of cards, you will generally find them come in a stout card-case. This can be changed into a thing of beauty. You



FOR A PACK OF CARDS.

will only want to use the inside case. Take it to pieces, and, upon the three narrow strips, which form the edges, shirr red India silk, leaving it quite full. On the back of each of these, sew a plain lining of the silk. Cover the back and front pieces with pale grey chamois, and put underneath each a little cotton to pad them slightly. For the inside put a plain lining of the silk. Then sew all the pieces together in their original shape, using red silk, and being very careful not to have the stitches show. For the front, paint in oil the four aces, with the loose ribbon arrangement given in the illustration. On the back, put in red lettering, "What shall I give, what shall I withhold." Where the little openings come at the top, sew two lengths of red ribbon and tie in a bow.

A Dark Bedroom Transformed.

MRS. M. J. ASHTON.

The house had been built seven years, and all the rooms were pleasant but one. That was a bedroom fifteen feet long, but little over seven feet in width and provided with only one medium-sized window, and that a north one.

What is more desolate or forlorn than a dark bedroom? I never went into the room that I did not wish for more light and sunshine, and finally decided that I would have a bay window added. As the "gude man" of the house never likes to be around when there is any repairing or building going on, I planned to have it done when he was away for a short vacation.

The weather was mild, so the carpenter was on hand ready for work. A large veranda with a flat tin roof came up to the bedroom window; a ladder was placed against it and was used for carrying all the lime and refuse by the outside way. The door into the hall was kept closed and locked. Boards were nailed up at night where the opening was made. The bay window was to be three feet deep and a little over five feet in width, with one east, one west and two north windows.

The framework was soon up and the floor laid. Then it did not take long to get the lath on ready for the mason to plaster it. A few bushels of sand was strewn on the floor to keep the mortar from staining it. At last the walls were pronounced dry enough so the carpenter could finish the casings and woodwork. The floor was cleaned, the new woodwork grained in oak to correspond with the rest of the bedroom. An inexpensive wall paper with cream ground and delicate leaves scattered over it with a frieze of yellow roses finished the walls. A Brussels carpet of oak ground with conventional design was chosen to cover the floor. Sash curtains of white muslin, scattered over with yellow dots, suspended by tiny rings strung on a brass rod were all the drapery needed, as there were inside shutters. As there was no clothespress, a wardrobe supplied that need. A black walnut bedstead, dresser, small stand and writing desk, with a few comfortable chairs, completed the furniture. A toilet cushion, some dainty mats and other fancy work lie on the dresser.

Few would recognize the room. The first rays of the morning sun gladden the occupant, and the beautiful sunsets are equally enjoyed. Would that every dark room could be transformed into as bright and cosy a one!

A Cleansing Fluid.

ALICE CHITTENDEN.

A most desirable article for every household is a really good cleaning liquid. The lapels and collars, of gentlemen's coats; the entire suit of the small boy, to say nothing of your own afternoon dresses, will all be the better for a weekly removal of spots and a thorough sponging. So-called cleansing fluids and pastes are expensive, and often unsatisfactory. It is much better and cheaper to make your own. Shave two ounces of white Castile soap into a pint of water, and set over the fire until it has dissolved; then add two more quarts of water, two ounces of ammonia, and one ounce each of glycerine and ether. Let it cool, and cork up tightly in bottles. When you wish to use it shake up, and put a teacupful into six quarts of water; sponge with a piece of flannel, and rub dry with a clean piece. To clean a very dirty garment, with many grease spots, use a cupful of the fluid to a quart of water, and sponge afterward with clean water. This is a most excellent washing mixture in the proportion of one part of the fluid to twelve parts of water, for woolen and flannel dresses.

Some Pretty Trifles.

Fold over a bit of rough card or Whatman's paper, and on the front, paint in water color the little girl peeping from the door as shown in the illustration. Lace together at the left with Japanese gold cord and letter down the side,

"If I mark the place in your book for you
Will you give me a penny bright and new?"

This little bookmark is meant to slip on the corner of the leaf of your book.

A QUAINT BOOKMARK.

A pretty banner for the guest chamber is made in the following way: Fit a bit of three and a half inch cream ribbon to a tiny brass rod, and fringe out the other end. Let your banner be about seven inches long. Cut a triangle of bolting cloth which will fit in across the ribbon, and paint on it one poppy head and a bud. In straggling red letters down the ribbon paint, "May thy sleep silent as night be and as deep." Tack the bolting on to the lower half of the ribbon, and it is ready to hang up.

A Spectacle Case.

ISABEL GORDON.

Get a beveled-edge card about seven inches long by five wide. The one before me now is cream, but you may make it in any color desired. At the left side punch two rows of holes which will narrow toward the bottom, then with lute-string ribbon of the same color as the card, lace on a long, narrow panel-like piece of celluloid, into which the glasses are to be slipped. Let the ribbons come together at the top and tie in two tiny bows. On the pouch, paint in gold lettering, "Just the place for your glasses." At the right

AN ORNAMENTAL CASE.

side of the card, paint an open fireplace in water color. Try to get as nearly as possible, with your yellows and reds, the glow and warmth of the blazing coals. A bright red, or orange rug, in front of the fender will add another bit of brilliant color, and use greens or blues for the vases on the mantel. Punch two holes at the top and tie in a loop of narrow ribbon to hang it by.

Midwinter Styles.

How light of hue and how long of skirt, the cloth gowns are this season! Pale and medium shades, as tans, grays, and lavenders, bravely lead in dressy suits, and they sweep the pavement, too, in a manner which makes the foot bordering of fur or velvet a useful as well as an ornamental adjunct. Every woman denounces trailing walking-dresses, declares them "a nuisance" hints at the possibility of their gathering microbes, and, forthwith, directs her dressmaker to add another inch to her next promenade costume. So tyrannical is iron-handed Dame Fashion. But think not that dark suits are abandoned! By no means. These are the serviceable frocks, and are extremely handsome of smooth cloth, one of the soft, rough wools, serge, or ribbed velvet. Ribbed velvet is the new name for corduroy, and entire costumes are made of it—especially in green and brown—while a good quality is much used in combination with other fabrics.

Basques are now either long or short, as the wearer prefers, and modistes predict the return of hip paniers in the near future. The waists of severe, tailor-made Cheviots are plain as the traditional pike-staff (whatever that may be,) buttoned straight up in front and with a rolling as well as a standing collar to finish the neck. All other bodices, however, are fanciful in the extreme with a pompadour or V of silk, velvet revers, plastrons or corselets, and edgings of fur. The new skirts are generally much gored, and are close and snug, with a fluffy trimming at the bottom. There are strips of fur varying from one to two inches on the pelt, feather bands, pinked out ruchings, or several rows of quilled narrow ribbon. The last named is particularly suited to evening gowns, when the same dainty ruching also encircles the neck and sleeves. Sleeves are still cut on the cross, wide and full at the top and tapering quite small at the wrists, where they are sometimes fastened with tiny buttons. Jacket sleeves frequently have the deep and flaring Louis XIV., or chevalier cuffs.

Tan colored coats embroidered, or merely edged

with jet beads, are very *chic*, and can be worn far into the spring. They are half long, double-breasted, and fastened with straps or frogs. For the present cold weather, they are comfortably trimmed with collar, cuffs, and front facings of brown fur which can be removed as the season advances. Long ulsters, with or without deep capes are also the rage; though it must be confessed the former have much the appearance of storm cloaks. Very elegant ones are of soft fleece-lined cloth, which only require a lining of silk in the sleeves to make them slip on easily. The garment covers the wearer from head to foot, is fitted in the back, and has lapped fronts closed by frogs in which are set tiny fur heads. The collar and edgings are also of fur.

The later importation of millinery shows an exquisite little bonnet in the pretty pointed Marie Stuart shape, with a crown of black velvet, and a black satin brim; the garniture being rosettes of pale pink or green satin, holding in place a tiny bunch of straight, slender ostrich tips. Midwinter round hats are much adorned with sable or mink tails, wired to stand upright in pairs and trios like a new species of *fleur-de-lis*. Thin, white veils scalloped around the edge are worn with these fur trimmed *chapeaux*.

The festive season is now in full swing, so young ladies will want to know something about evening gowns. Here the light cloths come in again, being liked for demi-toilette as they were last winter. The inexpensive silks, satin striped bengalines, and crapes in white or delicate tints are, on the other hand, admirably adapted for full dress costumes. Of any of these, ten or a dozen yards are sufficient, if the silk be fashionably combined with dark velvet. An excellent model which comes from Paris, has a pointed corsage that is cut half low and square in the neck. This square may be left open or else filled in with lace. The lining is hooked down the front, but the silk outside —shaped by one seam through the centre—closes invisibly on the left. A single form of velvet on each side with braces up the back give a pretty peasant dress effect. The elbow sleeves are, likewise, of the velvet with tiny cuffs of silk, but here I fancy a two-inch frill would be more graceful The neck, too, is outlined by a scant ruffle and velvet heading. Velvet ribbon is folded around the lower edge of the bodice, forming two finger-long loops in front, being knotted at the back to fall in ends one yard in length. The demi-trained bell skirt—five breadths at the bottom, and three at the top—is lined throughout, and has a balayeuse ruffle of pink silk set underneath. This same design can be worked out in cashmere and satin. Belted waists are liked for the house, as well as dressy little jackets of brocade or velvet with lace sleeves, opening over vests of surah or creamy mechlin.

Heavy cork soled boots, with high vamps and straight, instead of scalloped edges, are now sensibly worn for walking; my lady keeping her thin French kids for indoor use. Soft Dongola is, perhaps, the best leather for service; but rather more dressy are the shoes with cloth uppers, heavy kid vamps, and patent leather tips.

There is little change in the style of gloves; the grays, tans, and blacks still holding their prestige; while those for evening are white, or else exactly match the frock with which they are worn. Glacé kid soils less readily than the undressed skins.

A gold or silver girdle, with a big buckle, is a good purchase at this time of year, as they are reduced in price, and can be worn with any gown; while they wonderfully brighten black or very dull costumes.

Making a Feather Duster.

ELLA ROCKWOOD.

Select the finest of the turkey feathers, using those from the tail. A handle from an old duster is best, but one that will do nicely can be found, that has once served as a handle to a soup ladle or vegetable spoon, as they are often of wood, nicely painted black. Have ready some thick paste. Place a row of feathers around the end of the handle, tie with cord, and smear well with paste; then add another row of feathers, keeping the feather ends even, and wind and paste as before. When a suitable size is obtained for the duster, finish off with a few rows of the finer, softer feathers from the body of the turkey, and trim the quill ends evenly with a sharp knife. The quills and paste are to be covered with a bit of bright colored leather, taken from the inside of an old shoe or boot, if not too much worn. Cut the leather in sections, flaring them to fit around the part nicely; sew together and slip over the handle. The larger end may be notched fancifully, and the other end fastened in place by a few small tacks. If desired, a bit of gimp and some tiny brass nails will finish it exactly like the boughten ones. One of these makes a nice hearth brush, and with a small fancy dustpan, will be found convenient hung near the stove, especially if wood is burned, as there is always more or less litter from building fires. A much softer duster is made in like manner, using the longest of the fluffy feathers found on the under side of the turkey.

Stoves Old and New.

E. A. MATTHEWS.

When savage races began to use stoves, or a rude arrangement to hold their fires, it marked a great stride toward civilization. The most of them had known no other way of getting warm than to build a fire in the open air, and gather around it as closely as possible without scorching their skin. At last some enterprising individual began to see how much heat was wasted in these bonfires, and the first crude attempt was made at constructing a stove. Of course it was a very rude affair, that first stove, but the central idea was the same as in our most beautiful parlor heaters. The open hearth, with fire kept in slight confinement, is the ideal arrangement, and all stoves should take it for a pattern. It was the fire of our forefathers, and in some countries it is still the only way of heating.

The Esquimaux and Indians heat their homes by means of a fire built in the center of the room, the smoke escaping through a hole in the roof. But this is a very crude method, and would not suit any but the most primitive people. The stove of ancient Greece was a metal brazier, which stood in the middle of the room, and, as there was very little smoke attending it, the people enjoyed it, and to this day it is still found in that classic land. The Romans invented a furnace, which was very much like ours of the nineteenth century. It was placed under the house, in a small cellar, and the heat was conducted through crevices left in the floor and in the lower portions of the wall. The first chimneys were built in the fourteenth century, and were nearly like the fireplace of to-day. Generally, however, the fireplace was large enough to fill an entire end of a room, and thus large pieces of meat, whole oxen, and other animals, could be placed before the flames and roasted.

In old chronicles and ballads we read of holy pilgrims and crusaders, who wandered up and down, telling the stories of their battles for the Cross, and everywhere welcomed and placed in the warm corner nearest the fire. The choicest viands and reddest wine were given them, and they showed their gratitude by singing or playing on the harp, or chanting the glorious deeds of the Holy Crusade.

Never was the enterprise of stove-making carried on so widely and so successfully as to-day. Never were so many stoves sold, and never were such skill and art shown in their manufacture. The modern parlor stove is indeed a thing of beauty.

As long as our people move so frequently, they must have stoves that can be carried with them. Some day, when we have become more settled in our homes, perhaps all houses will be fitted up with heating arrangements as completely as with windows and doors.

How to Teach the Children to Work.

KATHARINE B. FOOT.

Teach the children habits of industry while they are yet very young, and they will always be industrious. Give them at first only very light tasks, and try to find the work to which each child inclines. Don't let them work so long that they become tired and so disgusted with all work, but long enough to accomplish something, and if it is of use so much the better. Do not teach children that it is a sin to be idle, but rather that there is a time to be idle as well as a time to be at work. The apparently idle time of the systematically busy man or woman is often the most fruitful in results, for it is then that many things are thought over and planned. When it is possible, let the children feel that they are working for some definite end. They wish to see the use and profit of their labor as much as older people do of theirs. Deny them that, and the very highest incentive to habits of labor is removed. A good and industrious woman once said; "One of the most bitter memories of my childhood is that my mother, who was one of the best and most conscientious women that ever lived, was without tact or judgment as to my tasks. On the long, beautiful summer days, when I longed to be at play, and when I ought to have been, since there are always enough dreary days in which to give a child work, she would give me two yards and a half of unbleached muslin which I was required to hem. It was always stiff and rough and disagreeable. If it had been fine, pretty work, I would not have minded half so much. Those hems had to be turned and measured and basted, until my poor little fingers ached, and my very soul rebelled at the task. When my work was badly done, I had to pick it all out and do it over; when it was well done the piece was torn off without a word of approval and thrown into the ragbag. I was in a state of bitter rebellion all the time, because my toil was of no use to any one. When I said so I was severely reprimanded, and told that children were no judges of what was good or bad for them. That is a great mistake, for children are much keener judges than grown people, as a rule, think them. Then I thought that my mother was very wrong and very cruel, but now I know that she was.

Inexpensive Dinners.

M. C. HUNGERFORD.

Stewed Kidney.—Buy half a pound of kidney, clean in salt water, brown it on a spider, and put it over the fire in a saucepan to stew slowly in one quart of water. If it is put on the back of the stove and covered it will require no attention. When it has cooked two or three hours season it with salt and pepper, put in a large quantity of potatoes peeled and halved, and add water enough to cover them amply. Boil till the potatoes are tender. Then pile them on a dish. Cut the kidney into bits and break up two or three potatoes to thicken the gravy, and pour the kidney and gravy over the potatoes. A little chopped raw cabbage is a good addition to this dinner.

A Savory Dish.—Two pounds of beef soup-bone, costing at the outside four or five cents per pound; half a pound of sausage and half a pound of suet furnish the staples for this dish. Boil the bone and suet four hours before adding the sausage, then boil slowly two hours longer. The next day the bones will be found quite bare, but before discarding them dig out every bit of the marrow and save for eating on bread. Many persons prefer it to butter. Take half of the solid contents of the pot, that is, meat, sausage and suet, and cut into mouthful bits, dredge flour over them and fry in a hot pan. Serve with mashed potatoes and turnips.

Another Economical Dish.—This is to be prepared from the half of the pot left after making yesterday's dinner. Put the liquor over the fire with two chopped onions in it and boil rapidly for twenty minutes. Chop the meat, sausage and suet fine, put them in the liquor and boil it up once. Take the pot from the stove, and when almost cold add half a baker's loaf broken up. Mix all together, season with pepper, salt and sage, and put into a bowl or deep pan in a very cold place. The next day it will turn out of the bowl like a mold of jelly. This can be prepared at the same time with the dinner described above. Slices cut from the mold can be warmed through in the oven or eaten cold with beets and vinegar.

A Potpie.—Have a neck of lamb or mutton broken by the butcher into small bits. Put it on to boil with only enough water to cover it. After it has boiled two or three hours make a crust by mixing a pint of prepared flour into a stiff dough with milk or water. Instead of boiling the crust in the ordinary way upon the top of the meat, make it into flattened balls and drop them into a large saucepan of salted boiling water. The crust is lighter and far more palatable when well surrounded by fluid, as it cannot be when cooked with the meat. After dishing the meat lay the crust on top of it and pour the gravy, first thickened with a little flour, over both crust and meat. Like all other dishes much of the excellence of this potpie depends on flavoring it agreeably.

BOYS & GIRLS

The Walnut Rod.

R. F. COLWELL.

My father was a physician of good practice in a wealthy quarter of Philadelphia, and we boys, four in number, were encouraged by him to live out of doors as much as possible. We played the national game, rowed, belonged to a well-equipped private gymnasium, and were hale and hearty accordingly; but especially did we prize the spring vacation which was always spent at our grandfather's farm, a beautiful spot in the Juanita valley, shut in by hills, and warmed by the sunshine, which always seemed to us to shine especially bright on our annual visit, as if to make up for the cloudy and stormy weather of March.

At the time of which I speak, the anticipations before starting were especially joyous. Harry, Carl and Francis, aged respectively eleven, fourteen and sixteen, had after earnest efforts in their school work been promoted each to the class above his former rank, and were in consequence proud and happy, though tired. I, Royal by name, a junior in a well-known New England college, working steadily in the course, was not unwilling to spend a week or two in quiet, searching the well-stored library which had the best that three generations of book lovers could buy on its shelves, and before whose cheery open fire we gathered at evening for stories and counsel from older and wiser minds.

We packed our bags, took our rods—for trout fishing was often good, even in early April, in a well-stocked brook that ran along willow-fringed banks in the south pasture—and boarded the train. At the station the hired man met us with a pair of Morgan horses than which I do not remember to have seen better from that day to this, and we were soon at the hall door, shaking hands with grandmother and grandfather, and, to our pleasant surprise, with Aunt Celia, who, unexpectedly to us, was at home. She was a widow, having lost her husband in the Mexican war, and was a teacher of modern languages in a girls' private school in Southern New York. She was one of those rare natures that the heart instinctively trusts, and no one of the many grandchildren hesitated about telling Aunt Celia his or her troubles, always confident that something would be done toward making the rough place smooth or gaining the object sought.

We had a cozy tea. The special good things, that only grandmothers seem to remember that a boy likes, were found beside our plates, and we did them ample justice. This was Saturday evening. The next morning we occupied the family pew, and raised our young voices in the familiar hymns, so clearly and joyously, that I remember to have seen many of the older people looking in our direction, and one old lady remarked as we were going out, "Henry's boys take after him for their good voices." Father had led the village choir for several years before he went away from his home to the medical school.

The next morning we took our rods and went off for a long tramp. We fished some, and between us, brought home enough for next morning's breakfast. The next day, we climbed the favorite hills and gathered four large bunches of that spring beauty *Epigæa repens*, arbutus, or Mayflower, whose pink cups and delicious woody fragrance we entrusted to damp moss, and sent the box with our cards to mother, for we knew how she loved the flowers she had picked from these same hills. Their scent comes back to me now, though it is many years since I have picked one.

Carl and Francis were just at the age when feats of daring were a delight to them. Harry was of a naturally timid nature, modest, and lacking sometimes in confidence, and so was often urged on by the other two, when he shrank from attempting anything, by such expressions as "Don't be a coward, Harry!" "A girl could do that!" which, by such a sensitive spirit, were felt more than blows of the lash would be. When I was by, the boys would not indulge in these trials of strength or endurance, but in my absence I knew they hurt his tender feelings by their taunts, though really they did not intend to. A boy looks for what he calls courage in his playmate, and, if he does not see what apparently corresponds to his own, he thinks him a coward, while the braver of the two may really be the more diffident and shrinking one.

It was Saturday afternoon; we were to leave Monday morning, and I had gone to the postoffice to mail a letter to our father, telling him to expect us Monday noon. Behind the barn was a large oak tree from whose trunk a long branch ran horizontally toward the shed roof, though at a considerable distance above it. The boys had been pitching quoits near the tree, and, having finished the game, looked about for some more exciting sport. Francis thought he saw it, so he climbed the tree, crept out on the limb, hung by the arms a moment and then dropped, with something of a jar, to be sure, but safely, on the roof, where he sat with a satisfied look. He called to Carl to follow him. Carl, though unwilling to try it, was still more unwilling to acknowledge any superiority of his older brother in that line, so he, too, climbed up, crept out, and, when he had found what he thought was a good place, and had called out two or three times, "Fran, shall I strike all right?" dropped and was happy. Then they both called to Harry, "Come on Hal," but he, overcome by the fear he had felt that they would fall while attempting it, refused to make the trial.

"JUMP, CELIA! IT'S A RATTLESNAKE!"

When they began to speak about what "a girl could do," grandfather came out of the back door, where he had been a silent spectator of the whole affair, patted Harry on the shoulder, assuring him that he'd more good sense than Carl and Francis together, and bade the climbers come down at once.

Grandfather was a man of few words, and they obeyed. Nothing more was said. I returned soon after. We had tea as usual and adjourned to the library, where a genial fire of hickory logs warmed and lighted the room. Grandmother and grandfather sat in their armchairs on each side of the broad hearth. I occupied an antique chair I had found in the attic, and which I was to carry home for my own room. Carl and Francis sat on old fashioned crickets, while aunt Celia had her low willow rocker in front of the fire, and Harry leaned against her, with her arm around his neck.

We remainded silent for some moments, when grandfather said quietly, "Celia, hadn't you better tell the boys the story of the walnut rod?" We looked up in swift surprise. The walnut rod spoken of, was one that had rested, ever since we could remember, across a pair of broad antlers over the fireplace, with an old sword and two muskets that had seen service at Bunker Hill and Yorktown. Often had we, in boyish curiosity, asked what it was, and why it was kept there, tied by a piece of faded ribbon to one of the antlers, but had always been put off with "by-and-by," and "when you are older." Now, when we saw a chance to know about it, we chorused, "Oh yes, aunt Celia, do tell, please," and she, quietly saying, "I suppose they can learn its lesson now," began:

"I was, as you know, the only girl of the family, and also the youngest child, your father being two years older. There were few neighbors when we first came here to live; indeed, our nearest was fully a quarter of a mile away, so we saw few beside our own family. Your uncles, John, William, and Elijah, were several years older, and so were busy helping father in clearing the land and in its care. Accordingly, Henry and I were much together. We studied the same book at our mother's knee, played with the same toys, and were together so much that the older boys sometimes called us 'mother's two girls.' But your father, though tender and gentle in appearance, had a brave heart under his little jacket, and I knew better than they, that he was no coward, They called him so sometimes, thinking, because he seemed fearful about some things they counted trifles, that he really had no courage. I'm afraid boys have forgotten nowadays, that mere daring is no test of true courage." Here, Francis and Carl felt their faces grow hot, but aunt Celia said no more and went on.

"It was one day in April, very like to-day, that we all went upon the side hill to pick May flowers. Henry was nearly twelve years old, his birthday, as you know, is next month, and I was ten. It had always been a habit, when people went out in the spring for flowers, to cut a stout stick, to be used partly as a walking stick, and partly as a protection against snakes, which were often seen, but which usually escaped before they could be reached. Old people told of rattlesnakes that used to be seen, but they were very scarce, even then, and none of us had ever seen one.

"We all had sticks, cut from a bunch of hickory saplings that grew beside the path, and your uncle Elijah said, as we were going along, 'I wonder what Hen would do if he heard a rattlesnake; turn pale and faint away, I guess,' at which the others laughed loudly, but Henry said nothing, though I saw his lips quiver at the taunt.

"We found the flowers, thick and beautiful, just as you have this week. We picked all we wished, ate the lunch which mother had put up for us, and were sitting on a large, flat stone, talking of starting for home. I saw a bit of pretty moss under some twigs at the edge of the stone, and stepped down to get it, when suddenly a peculiar whir-r-r, that we never had heard before, struck our ears. All the boys started up, looking about eagerly. The bushes at my side parted slightly, and the flattened head of a large rattlesnake protruded, and again came that dreadful sound. Then the boys jumped from the rock, each in a different direction, and screamed, rather than cried, 'Jump, Celia, it's a rattlesnake!'

"I could not move. I must have been paralyzed by fear, for, though I was but a child, I could not misunderstand my danger. Of course, what I am telling, happened in a few seconds, but I remember hearing the swish that a stick makes when it cuts through the air, and the horrible head, with its forked, vibrating tongue, was severed from the writhing body, and fell at my feet.

"Harry had quietly stepped down by my side, and with his stick, the one you see on the antlers yonder, had saved me from a dreadful death. There he stood, pale and trembling to be sure, but with such a light in his blue eyes, that none of his older brothers dared ever call him coward, or girl, again. We walked quietly home, bringing the body with its horrible horny scales, to show to father and mother. I shall never forget how they clasped us in their arms as they listened to the story, and how I wondered, as a child will, if everybody, when they were grown up, cried when they were very glad.

"Nothing was ever said to the older boys. They had learned what true bravery was, the scorn of self-protection, when another needed help, and they have been better for it ever since. Your father has never had the story told to you, thinking that some time it might also teach you the lesson that true courage from its root word, the Latin *cor*, and down through the French *coeur*, is both below and above any outward manifestations, and belongs to the heart.

"The snake must have come out into the sun from his den under the rock, and was not as active as in warmer weather, or the bite would have followed the first alarm. There has never since been seen another in this locality."

We sat in silence for a while, and than grandfather spoke, laying his hand on Harry's curls, "I seem to see my boy Henry again in his son, Harry. I hope he will grow up into the same brave, though tender manhood of his father, and remember, boys, "he said, turning toward Francis and Carl, "that recklessness and a desire to be thought bold and daring, are not an index of true courage and often have no connection with it. If the walnut rod teaches you this lesson, its story will be of great value to you."

Up in a Balloon.

N. R. BRIGGS.

It is said that only cranks go up in balloons and risk their lives by so doing, but this seems untrue when one meets and enters into conversation with a professional aëronaut. As a rule, they are pleasant, intelligent, and cool-headed people. This does not include those reckless and daring aëronauts, who, for a few paltry dollars, risk their lives by jumping from their balloons and coming down hanging to their parachutes, which were intended, as is a lifeboat on a vessel, to be used in case of necessity, not as a plaything to amuse the people. A well-known lady aëronaut, who has made over 300 successful balloon ascensions, said, as she stepped from the elevator of that big observatory at Coney Island, which is said to be 300 feet high, "I would rather go up in one of my balloons, than to go up to the top of that observatory again. I would feel safer." While this may be true, it is doubtful if she could persuade many to change places with her.

"I have made nine ascensions in a balloon with my papa and sister," said Miss Mamie Allen the other day, "and I don't think I should be called a crank either." Misses Mamie and Rosie Allen have been visiting cloudland with their father since they were five and three years of age, and have made nine and five ascensions respectively. The following account of two of their ascensions is given by the elder sister. The first trip was made on a public holiday and from their own city:

"Father had been engaged to give a balloon ascension as one of the attractions of the day. There were six in our party, and at 10 a. m., the appointed hour, we stepped into the big basket or car of the balloon, and while the people were cheering and the band playing, we shot up into the clouds. The sight of the balloon to those we had left below was of short duration, for the clouds hung low and threatened rain, and in a few minutes we were sailing along above them in sunshine and a clear sky. We had a large fish-horn that we blew occasionally, wondering what the people below who heard it would think. We could hear plainly the rumbling of trains and the whistles of the locomotives. It was very warm, being in the latter part of June, and we had to fan ourselves to keep comfortable. After sailing along and enjoying this novel sport above the clouds for over two hours, and not once during this time getting a sight of the earth, papa let out some gas and we began to descend slowly through the clouds, landing safely in a field near Cumberland Hill. A cow was grazing near and, seeing our big balloon, she became so frightened that she ran into the woods. We were told afterwards that it was three days before she could be induced to come out into the open pasture again.

"Of course it is decidedly more pleasant to go up on a fair day, when the atmosphere is clear; it is then that one can see long distances. Such a day we afterward enjoyed. It was clear and beautiful, and fully four o'clock when our party, which again consisted of six, climbed into the car and ascended toward the sky. In passing over the Providence river, we could see the fishes and the rocks at the bottom of the river plainly; such a thing would have been impossible had we stood on the banks of the river. We could see nearly the whole length of the river, while the shore resorts and a beautiful view of Narragansett Bay gave a grand panoramic effect. We landed after a delightful trip near Bridgewater, thirty miles from our starting place. Do we get dizzy when looking down from such lofty heights? No, not at all; there is no such feeling, and none of that unpleasant sensation generally experienced when looking down from the top of some high building or observatory."

An amusing incident took place near Saratoga some time ago, in which two little boys played a prominent part. A well-known lady aëronaut gave a grand balloon ascension at that place. After traveling over the country for thirteen miles or more she concluded to make a landing, and, seeing three little boys playing in a field, she called to them to help her. As soon as the balloon touched the ground, two of the little boys, who had hastened to her assistance, grasped hold of the ropes and basket and held fast, but the third little fellow was afraid of the balloon and would not go near it. The other two were not heavy enough to hold the balloon down till the lady could let out the gas and, as there was a little wind, the balloon bounced up into the air again, then down to the ground, and then up, sometimes a hundred feet or more. All this time the two plucky little boys held fast to the ropes and basket. After skipping and hopping up and down over the fields and fences for over a mile, the lady finally ripped the balloon open with a rope fixed for this purpose, when the great balloon fell flat on the ground like a big bag.

In the Press Room.

WEBB DONNELL.

Whether one is of a mechanical turn of mind or not, he could hardly fail to be interested in his surroundings, if he should find himself in the press room of a great daily newspaper, witnessing the working of machines that seem almost human in their deft turning of plain, white paper into completely printed, folded, and counted piles of newspapers. The press room of a city daily, is usually in the basement of the building, where night and day are very much alike, so far as light is concerned. Here are to be found from one to six presses, each one capable of printing the whole paper, or, it may be, but four of its sheets. Where six complete presses are used, six entire papers can be printed simultaneously, so that enormous editions can be very quickly worked off, thus allowing the editors to wait for important news until the very last moment. The method of printing may be briefly described. The paper comes from the paper mill in enormous rolls, of a width to accommodate either two or four pages, according to the size of the machine. Where four pages in width are printed at one time, the paper is divided in two parts, by passing over a cutting wheel before entering the folders.

Taking our stand now at one side of the machine, we can see the paper passing from the roll suspended above it, down to a cylinder, on which are the stereotype plates, curved to fit the rounded surface. These cylinders, as before suggested, may accommodate either two or four pages, side by side. The stereotypes can, of course, be multiplied to the number of presses that are used. The paper, passing over the first, is printed upon one side, and then, passing under the second, is printed upon the other side. The printed roll of paper, two pages in width, is then carried over and down across a V-shaped plate, the apex making the fold

in the middle, between the pages. From this point, it passes down through a series of rollers, and emerges folded, ready for the newsboys, and counted out in piles of fifty each. Each of these machines has a maximum capacity of four hundred copies per minute, or twenty-four thousand per hour, but this rate of speed is rarely used, except in cases where great haste is necessary. A speed of half this number is perhaps nearer the average. At this rate, even, not much time elapses before the plain, white paper on the roll is scattered about the streets, in horse and steam cars, in hotels and business offices, giving information of the events of the preceding twenty-four hours.

The King of the Feast.

AGNES CARR SAGE.

Once upon a time,—to begin in the good, old-fashioned way, which, of late, seems to be going out of style,—a coterie of birds and beasts determined to hold a holiday feast, and, for this purpose, took quiet possession of a huntsman's lodge, standing on the border of a beautiful forest, that, in summer, was green as an emerald, but now like a dream of the frozen North, with graceful wreaths of driven snow hung from its drooping boughs, and icicles glittering on every spray. The wise old Phœnix—nearly five hundred years old—was invited to preside at the head of the table, and, of course, the kingly Lion was to grace the board at the other end. But, alas! the very day before the grand collation was to come off, His Royal Highness had the misfortune to tread on a sharp thorn, which ran so deeply into his foot as to make him awake the echoes with his roars of pain, and, what was worse, kept him at home on the gala night, with his fore-paw wrapped in damp moss, and anxiously tended by Queen Lioness, who is devoted to her tawny lord and master.

THE HOLIDAY FEAST.

"The creatures will have to get on without me," he growled, to his nephew, "but go you, Felida Wild-Cat, as my representative, and mind you keep an eye on that upstart of a Baron Boar, who is always trying to usurp my place!"

To this his young relative readily agreed, and scampered off, gay as a lark, in his best Sunday go-to-meeting jacket, and with a nobby little Tam o' Shanter jauntily crowning his fuzzy head.

Impatiently the company awaited the coming of its king, but when, in his stead, the small messenger arrived, with the royal mandate, fierce and indignant was the uproar.

"Give the seat of honor to a chit of a kit like that, and let him lord it over us, as master of ceremony! Never! We will bite off his ears first! King Leo must be mad, to suggest such a thing!"

Indeed, so loud and confused became the babel of voices, that, at length, the Phœnix was forced to rap for order, and declare that she, and she alone, would settle the matter. "With most of you, I agree that it is not fitting a mere cub should be so distinguished, and, therefore, call upon the others to recite their claims to precedence, that I may decide who is most worthy to be the ruler of the feast."

"Really, dear madam, I think there can hardly be two opinions as to that," cried Ursa Major, "since my brother and I are both present. After the lion, who holds so exalted a position as the bears, descended, as we be, in a direct line from the sons of Jupiter, changed by Juno into beasts, but by him transformed into glorious constellations? The Laplanders, too, call us the 'Dogs of God,' while the sensible Norwegians say we 'have the strength of ten men and the wit of twelve.'"

"Ay, ay," put in little Ursa Minor, "and very respectfully do they always speak of the bear as 'the old man with a fur cloak.'"

"Fudge! nonsense!" grunted Baron Wild Boar, rudely. "There is an ancient proverb, 'As the bear has no tail, for a lion he'll fail,' and you would look about as well in the king's place as yonder green goose."

At this slur, Mother Goose bridled and hissed until her headdress quivered, sputtering out that she was sure "it was an historic fact that geese had saved Rome."

No one paid any heed to her, however, for the insolent Pig continued loudly, "Anyone who is versed in Christmas lore will tell you that the boar always comes first, at a holiday feast,"—though in just what manner, he neglected to mention—"and is often escorted in by a band of musicians to sing his praise. That is because Freyr, the Scandinavian god of peace, whose festival is at the merry Yuletide, used to ride on my distinguished ancestor, the great Boar Guillinbusti."

"There is precious little peace where you are, then," sneered the young Wild-cat, showing his teeth from ear to ear, at which the Hen cackled: "Oh, my eggs and chickens! Don't stand there grinning like your Cheshire relative! You make me so nervous, I feel as though I should fly! Do you want to snap off my head?"

"Which the traditional Cheshire cat could certainly never have done," mumbled the learned Phœnix, solemnly, "seeing she was made of nothing but cheese."

At the word cheese, a poor little Church-mouse popped her whiskers out of a hole, but popped them in again, in a hurry, when Chanticleer, fancying his wife had received a snub, blustered and crowed loud enough to raise the roof, while he declared he meant to be "cock of the walk," and of the supper, as well. "For, verily, we be birds of high degree," he piped, "and shine in gold on many a church spire, because of the reminder we once proved to St. Peter. The Prophet Mahomet, too, has recorded that he found a celestial rooster in the first heaven, so tall that its comb touched the second sphere, and whose crowing awoke every living creature from sleep, except man; while wise Moslems say, 'Allah lends a willing ear to him who reads the Koran, to him who prays for pardon, and to the cock whose chant is divine melody.' You perceive, therefore, we are much thought of, by both Christians and heathen alike!" and Chanticleer strutted about, as though his claims were unanswerable.

"Tr-r-r-oonk, tr-r-r-oonk, tr-r-r-oonk!" croaked a pop-eyed, aldermanic looking Bull-frog. "What is ancestry to art! and who so accomplished as we musical Batrachians, who have been dubbed 'Dutch Nightingales,' on account of our sweet, melodious voices;" and believing that "music hath charms to soothe the magic breast," Master Bully trilled forth the plaintive ditty, "A Frog he Would a-Wooing Go," but with so many variations, quavers, crescendoes, and struggles to reach high C, that his listeners were fain to cover their ears, while Ducky-Daddles quacked from sheer misery.

Meanwhile, the wise Phœnix sat in deep meditation. All had put in their claims except Mr. Drake, who was raised in a mud-puddle, and knew he stood no chance; but it was difficult to choose between so many rival candidates. To tell the truth, she really inclined to shaggy, good-natured Ursa Major, but there was a fiery gleam in Baron Boar's small eye that bade her "beware!" and when, on the young Wild-cat declaring the supper was all getting cold, the descendant of Gullinbusti coolly slipped into the Lion's chair, and, evidently thinking "possession nine points of the law," prepared to defend his position with hoof and tusk; the ancient fowl concluded that "discretion was the better part of valor," and gravely nodded approval. So, too often, does might and brute force triumph over right. This was certainly cowardly, but what can one expect from a bird who has nearly celebrated her fifth centennial! Felida looked disgusted, and wondered what his uncle would say. Mother Goose hissed, and the Frog croaked; but the elder Bear set them a good example, by sitting down quietly to gnaw a bone, while his brother and the Drake carried their favorite dainties to a lowly and secluded corner, where they made friends with the poverty stricken Church-mouse, who crept timidly out to beg for a few crumbs from their plates.

But, ah me! It would surely have given the aristocratic Lion a roaring fever could he have seen the manner in which his substitute behaved, putting his hind foot on the table, kicking the wine bottles, and lifting his bowl of soup into the air, that he might drink from the dish; for, as Chanticleer whispered to Henny-Penny, "A boar is nothing but a big hog, after all!"

Thus, in heart-burning and discontent, the grand collation waxed and waned, the Phœnix becoming every moment more stiff and severe, as she glared at her *vis-a-vis* through her gold-rimmed spectacles; while, at last, a terrible alarm broke up the company in dismay. The grateful Church-mouse, having, for once, had all she could nibble, stepped out for a breath of fresh air, but returned in a bustling hurry, squeaking: "The huntsmen! the huntsmen! flee for your lives!"

O, terror! O, confusion! Master Frog never stopped to finish his bullrush coffee, but made off with a hop, skip, and a jump, closely followed by

the barnyard delegation. The two bears kindly waited to help the infirm old Phœnix, but they also got away; while Felida Wild-Cat, feeling he had a family grudge against Baron Boar, and now was the time to settle it, deftly overturned the table directly on top of that dignitary, and then darted out, slamming the door behind him.

In vain the caged animal struggled to free himself from the mass of tablecloth that entangled his limbs, the heavy mahogany which pinioned him down, and the broken crockery cutting into his flesh. No use to roll and rage! The huntsmen came and caught him, and his wildwood haunts knew him no more; while the legend runneth, in Forestland, that he had the honor of gracing another holiday revel, with a lemon in his mouth, and sprigs of rosemary adorning his bristling ears. In life and death, the Boar was King of the Feast.

Breakfast Table Talk.

ADELAIDE L. ROUSE.

I often wonder that so little is said about breakfast table talk, which is of more importance than tea table talk, pleasant as that is; for it is necessary to begin the day right, and nothing helps to make a day bright, so much as cheerful chat around the breakfast table. I was impressed with this during a recent visit. My friend and hostess is one of the busiest of women, but she manages to find time for culture and study, by carefully watching the "chinks," as she calls them. She always has something interesting to tell or quote at breakfast, no matter how hurried she is; and let me add that she never forgets to put some kind of a bouquet on her table, the year round. True, in winter it may be only a spray of scarlet geranium and a leaf or two, but the little vase in the center of the table is never empty. She has a way of studying literature that interests the whole family, only she is very careful that they do not guess what she is driving at. One morning, last July, the vase in the center of the table held a bunch of Scotch thistles. It was a strange choice for a bouquet, and *paterfamilas* jokingly asked her what she was after.

"I was looking over the calendar this morning, and I saw that Burns died just ninety-five years ago to-day. Could I have a more appropriate flower than the Scotch thistle? We all know our Burns pretty well, I think, and impromptu quotations are now in order. This is mine:"

"Is there for honest poverty
Wha hangs his head and a' that?
The coward slave, we pass him by,
We daur be puir for a' that,
For a' that and a' that,
Our toil's obscure, and a' that;
The rank is but the guinea's stamp,
The man's the gowd for a' that."

"Now it's your turn," she said to the visitor. The visitor could not think of a quotation at the instant, but the hostess suggested the stanza, beginning,—

"But pleasures are like poppies spread,"

And after some prompting I got through it, mentally resolving that before I visited in that house again I would brush up my acquaintance with the poets.

Paterfamilas followed quickly, with a quotation that voiced his own sentiments:

"Gather gear by every wile
That's justified by honor;
Not for to hide it in a hedge,
Nor for a train attendant,
But for the glorious privilege
Of being independent."

The big boy of the family gave, with great gusto:

"Come one, come all! this rock shall fly
From its firm base as soon as I."

But instead of discouraging him, by laughing at his mistake, his mother spoke of Scott and Burns together, and related a story told by Scott himself. He was in a tavern once, when a small boy. A handsome, black-eyed man was talking with some companions, about the authorship of an old song. Scott, who was an antiquarian, even then, gave the author, and Burns let his brilliant eyes rest for a moment upon the lad, who never forgot the glance.

Anecdote after anecdote followed, till one of the little girls grew so interested that she left the table, and came back with a volume of the poems, in which she proceeded to look up a disputed passage. The symposium ended with a little talk from the mother, on the fault in Burns' character—a lack of strength. That little breakfast table talk was an inspiration to us all day, and I wished there could be more such breakfast tables.

A PUZZLE OF FAMOUS NAMES.

Cash Prizes for the Best Solutions.

A new puzzle is given this month, which the readers of the AMERICAN AGRICULTURIST will find full of interest and novelty. The supplying of the names of the seventy noted Americans will be an exercise affording instruction as well as entertainment. All the names given are of characters which will readily be recognized as illustrious, and all of the definitions can be corroborated by reference to Webster's Dictionary. The prizes will be awarded to the most complete and perfect lists of names supplied and, if there should be more than one perfect list, the preference will be given to the neatest and most legible of the perfect lists. Answers should be arranged in column lines for convenience of examination and care must be taken to make no mistakes in numbering them. Answers must be addressed to the Puzzle Editor, AMERICAN AGRICULTURIST, New York, and all lists must be mailed not later than February 28th.

THE PRIZES.

First Prize, Five Dollars in Cash.
Second Prize, Three Dollars in Cash.
Third Prize, Two Dollars in Cash.
Fourth Prize, Gold-lined Fountain Pen, value $1.50.
Fifth Prize, AMERICAN AGRICULTURIST Microscope, value $1.00.
Sixth Prize, Mineral Cabinet, value $0.85.
Seventh Prize, Relief Fountain Pen, value $0.75.
Eighth Prize, Jackknife, value $0.50.

SEVENTY NOTED AMERICANS.

Memory, tradition, and the voice of current fame summon before us a grand procession of notable Americans. Some wear the courtly dress of colonial aristocrats; some the rough garb of the woodsman and the pioneer; some the plain clothing of the modern American citizen. There are statesmen, rulers, scholars, philanthropists, and inventors; men of muscle who have conquered the wilderness, men of brain who have conquered the world of literature and the field of invention. First among the great Americans of the past is always recalled the name of (1) a domestic employment and a heavy weight. Great as he was in leadership, equally great in wisdom and patriotism was his contemporary (2) a letter free of postage and a pool. From the stirring times in which they lived there have come down many poetic traditions, one of which is charmingly told by our own extended comrade (3) of a ride taken by (4) one of the apostles and to venerate. A memorable congress was held in the city founded by (5) an implement for writing. A song full of pathetic inspiration, which has become a national air, was written by (6) a part of a piano. One of the earliest and bravest of the Western pioneers, who founded an important State, was (7) a prophet and a benefaction. A man of wonderfully brilliant parts in the latter part of the last century was (8) a small circular saw, but he perverted his great talents and died in dishonor and obscurity. Distinguished alike for his patriotism and his unbelief was (9) suffering or distress, who though a Quaker's son held extremely radical views and was the author of a book which has been greatly berated. A noted governor of Massachusetts in Colonial times was (10) a kind of nail and a crossing-place. He confirmed an important treaty with Chief Massasoit. One of the most famous and eloquent of statesmen was (11) a prophet, a textile fabric, and a tumult. One of the first Americans to win distinction as a writer of tales was (12) a man who makes barrels, and among our modern successful fiction-writers may be named (13) a strong rope. The followers of one great political party still swear by (14) a wooden wedge and a near relative, who was a president of great force of character. Another president of military renown was (15) a man who fashions clothing. Thousands of school boys and girls of a generation or two ago puzzled their brains over the problems of (16) charred wood and a hurt by fire, who was a great mathematical genius of his time. A famous American historian who lived to a good old age was (17) an interdiction and an inclosed field. Chief Justice (18) showy bird was the first chief justice of the supreme court of the United States, and a president whose birth-year was 1800 was (19) a full supply and a greater quantity. The foundation of one of the enormous fortunes of the country was laid by (20) an autumn flower. A statesman of winning personality and great popularity, for whom a great many boy-babies were named, was (21) a soft earth, of Kentucky. High honors were won by (22) a walking staff, as an Arctic explorer, and later by (23) vapor that obscures the air. To enter the field of invention, there was (24) a cryptogamous plant, who brought to practical service a wonderful means of communication between distant places, and (25) cleared land, who planned and perfected the Atlantic cable. Innumerable city buildings and homes are made comfortable in winter by a system introduced by (26) a shrub of the genus ilex, who is a famous worker in iron. One of the ingenious devices for aiding women's work has made fortunes for the (27) musicians and (28) badges of mourning, two of the names which have become famous by improvements upon the machine. Pioneers in the anti-slavery movement, who suffered and risked much for the cause, were (29) a fortress, (30) affection and happiness, and (31) a charming month. Two great generals, who fought on opposite sides in the civil war, were (32) a transfer of property, and (33) a place defended from the wind. The greatest American tragedians have been (34) an extensive wood, and (35) a temporary shelter. The last surviving signer of the Declaration of Independence was (36) a song. A fortified town (37) won renown by his labors in behalf of abused animals. The greatest showman of his time was (38) a tribunal and stupefied. A famous and forcible Methodist preacher of olden times was (39) a two-wheeled wagon and an artificer. Two of the great publishing houses of the country were founded by (40) a player on an old-fashioned instrument, and (41) a fruit and a weight; while extensive advertising of patent medicines has made famous the name of (42) a head-covering, (43) a color and the thigh of a hog, and (44) musical tunes. A noted general of Massachusetts, who was once governor of the State, was (45) a male house-servant. A famous writer of books for children some thirty years ago was (46) one of a class of bishops, and a prolific writer of sensational stories at about the same time was (47) the spike or center on which corn grows. The name of (48) an English hedge-shrub immediately recalls a great American author. A patriarch, an opaque film and a bustle, (49), compiled a book of reference which has been a standard for three generations. A famous navigator whose books used to be read by boys with great delight was (50) one who prepares food. A popular writer of stories of adventure was (51) a State and a rustic pipe. Among successful or noted American female writers of the past are the names of (52) a plant that grows in wet grounds and a cord made of soft cotton threads, (53) to compactly arrange, (54) a young person, (55) one who warns, and (56) a point of compass and value. A capable female historian is named (57) the young of a sheep, and the pioneers in the study of medicine by women were named (58) a color and a spring of water. A noted Georgian, a brigadier general of the confederacy and who died "unreconstructed" was (59) a place of sepulchre. A noted artist born a Quaker, was (60) a point of the compass, and the founder of an extensive lecture bureau was (61) a bright color and a footway. Among the presidents previously unmentioned were (62) one who stands as doorkeeper of a lodge, (63) to adhere closely and solid matter of the earth, (64) a boy's Christian name, (65) to penetrate, and (66) angry, a pronoun and a male child. An admiral of the navy recently deceased was (67) a bitter malt liquor. The name of a plant of the genus pisum and a solid substance (68) recalls a generous philanthropist, and so does (69) an apostle and a barrel maker, who founded a noted school. (70). A division of a chain and a preposition forms the sound of a name as famous as the one with which the list began.

ANSWERS TO THE DECEMBER CONTEST.

29.—The letter L.
30.—Syzygy.
31.—Tenderheartedness.
32.—No eye to watch, no tongue to wound us,
All earth forgot and all Heaven around us.

THE PRIZE WINNERS FOR DECEMBER.

First Prize, John B. Grant, 108 Duane street, New York City.
Second Prize, L. Goss, Box 33, Fair Haven, Mo.
Third Prize, Miss Clara F. Prescott, 189 High street, Lawrence, Mass.
Fourth Prize, Charles M. Hazzard, Poplar Ridge N. Y.
Fifth Prize, W. A. Breckenridge, Palmer, Mass.

A Glimpse of Chili.

Chili is a country of which very little is known in the United States as to its political life, its geographical peculiarities, or agricultural capabilities. It extends from fifteen to sixty-five degrees south latitude, or fifty degrees. It presents extremes of climate as opposite as can possibly be. The northern fifteen degrees is the rainless region, which is a mineral country, and from which comes the greatest wealth of Chili, its nitrate, borax, iodine, copper, silver, and gold. It is a desert, only there are near the foot of the Andes a few oases which are irrigated by water from the melting snow of the mountains. From thirty to forty-five degrees is the agricultural country. North of Valparaiso it is quite dry. From Valparaiso to Concepcion, while more rain falls, it is only during the months of June, July, and August, the winter season. The two months before and the two after these have occasional showers. This means irrigation for any crop but grain. South of Concepcion there is more rain, and over a longer period of time. South of forty-five degrees it rapidly grows colder, and there is an increasing precipitation. It is nothing but a broken mass of rocks, glacier-bound hills, and general desolation. Near Concepcion the climate is anomalous. Oranges, limes, and lemons grow in the open air, there being no frost severe enough to kill them; still, it is not hot enough to produce Indian corn as a successful, paying, field crop. The nights are never hot. Apples, peaches, pears, and plums grow well. Plums by the bushel, all of which not less than three inches long, are quite common; and single specimens often attain a length of four and a half inches, and are fine flavored.

The Chilian methods of farming are years behind the times, but the Chilian wants to know the best way, and novelties and new things go with them. They are the Yankees of South America. There are few Americans here; the language is Spanish. Most of the trade is in the hands of the English and Germans, but because American goods are not better known is the fault, alone, of Americans. American exchange is not to be had and, consequently, American bills must be paid with exchange on England. In the post offices here I can get a money order on China, Japan, Switzerland, Belgium, Holland, or Denmark, but the great United States has no money-order system with Chili. Chili has done much to aid immigration, and anyone who comes here with the idea that without money and a knowledge of the country he can get on, had better have stayed away. But any one who has money, say $4,000 to $8,000, gold, to begin with, good common sense, willingness to put labor and brains with his capital, and some little knowledge of Spanish, the language of the country, has a good chance of success.

GEO. D. COLEMAN, Chili.

Venezuela Pastoral Industries.

Venezuela is among the richest, but least developed countries, in South America. With an area of 633,000 square miles, only the mountainous coast belt, with a breadth of seventy miles at La Guayra and Puerto Cabello, and one hundred miles at Maracaybo, is under any degree of cultivation. Behind the mountain slopes and coast ravines, where coffee, cacao, and oranges, are raised, there is one of the finest pastoral belts in South America. It extends southward, beyond the Orinoco, to the edge of the dense woodlands, which have hardly been explored by white men. This is a district admirably adapted for cattle-breeding, and remarkable progress is making in the industry. In fifteen years the herd of horned cattle has increased from 1,389,802, in 1873, to 8,476,291, in 1888. The plains are covered with grasses, which are suitable for sheep as well as cattle. The number of sheep and goats has run up from 1,128,273 to 5,727,517. The number of horses, mules, and donkeys has increased, during the same period, from 422,000 to 1,547,164. While statistics are lacking, it is probable that, since 1888 the cattle herd has gained 1,000,000 a year, so that it is now about 11,000,000. This is a safe deduction from the increase in the exports of hides, which now exceed $1,200,000 a year. While Uruguay and the Argentine Republic have finer sheep lands than Venezuela, their resources for cattle-breeding are not superior to those of the Orinoco valley. There is a well-watered plain of vast extent, where the rainfall is abundant, and the grass of the most nutritious nature. The only thing lacking for the establishment of pastoral industries of magnitude in this rich grazing belt is population. If European immigrants could be attracted to the Orinoco valley as they have been to the pampas of the Argentine, it would not be many years before cattle-breeding and sheep-raising were sources of wealth superior to coffee farming, which is now the most remunerative industry.

SENOR DON, Valencia, Venezuela.

The Zacatecas Famine.

A broad area of Northern Mexico suffered last year from drouth and frosts, and a large body of population is now without food supplies. The State of Zacatecas is the center of this famine belt. It has an area of nearly 23,000 square miles, and is a high table-land, cut by mountain chains, with valleys which are ordinarily fertile. The population is 527,000, Zacatecas, the largest city, having 37,000 inhabitants. As the table-land is between 5,000 and 7,500 feet above sea level, the temperature is low for the latitude, and the products are those of the northern temperate zone. The trees are elm, oak, and ash; the fruits are apples, pears, peaches, and grapes; and the field crops are corn and wheat. There are large tracts available for pasturage, and herds of cattle thrive well, in ordinary seasons. The district is not well watered, and irrigation has not been systematically conducted. As maize is the principal crop, the drouths are not destructive, as a rule, although pasturage for the cattle dries up, and is burned by the sun nearly every year. The last season has been one of unprecedented drouth, and it has been followed by cold winds and heavy frosts. The corn and beans, upon which the mass of the population and the mining camps are mainly dependent for subsistence, have been killed, and there is now a great scarcity of food.

The officials of the State have been making contracts at El Paso, and at Monterey for securing food supplies from the United States. The high duties at the border will increase the cost of food, and a population, naturally improvident, is without means for purchasing it. The Mexican peon seldom has savings in reserve for hard times. While the old system of peonage is slowly disappearing, and no longer has the sanction of public law, the habit of running into debt to employers remains. With his little patch of maize and beans, he cannot be convinced that he can ever be utterly without food; and he works for his employer with the understanding that he is to be paid in advance, and assisted if sickness comes into his poverty-stricken household. This year drouth and frost have been arrayed against him, and he has no supply of food at his command unless he plucks up the roots of the magueyes and tries to make a soup of them. The condition of a Mexican center of population in famine time is most deplorable. State aid alone offers promise of relief. AMERICAN WAYFARER, Zacatecas, Mex.

Silk Culture in Italy.

While silk is produced here very largely, grape culture is the principal industry of the country. Only for this crop the mulberry would not be grown to the extent it now is, as the trees are mainly for the support of the vines. They are planted in rows fifty feet apart, and about sixteen feet apart in the rows. To these, with the aid of strings or wires the vines are trained, the trees taking the place of stakes. They thus answer a two-fold purpose, a support for the grape, and the leaves for silk. To this may be added another source of revenue, the branches, which are used both for fuel and for the silkworm to fasten its cocoon upon. When young, the trees are trimmed up to about six feet in height, when they are allowed to branch out, which they do in all directions, forming a very regular head. In the early spring the branches are cut to within one or two buds of the main stem, as the vines are trimmed. This severe pruning is necessary, as the leaves are much larger, more easily gathered, and are relished much better by the worms. This is important, as upon the healthy condition of the worm depends the quantity and quality of the silk produced. It is important, too, that in a given locality, the leaves should be as nearly uniform as possible in substance and nutritive matter. This makes uniform cocoons, which invariably bring a much higher price than those of irregular size and color. There is a wide difference in the quality of the silk produced from the leaves of the trees grown under different circumstances and in various soils. The leaf of the white mulberry tree (*Morus alba*) planted in high, light soil, exposed to cold, dry winds, produces, generally, a large quantity of strong silk of the purest and finest quality. The leaf of the same tree, planted in damp situations, in low grounds, and in a stiff soil, produces less silk, and of an inferior quality.

At the best the industry is a poor one, as the manufacturers are very exacting, and will make unreasonable objections to the cocoons in order to buy cheaply. There is no small value, when we consider the scarcity of fuel in those countries, in the branches which are put up in bundles and sold, as we sell cord wood. Each tree yields but a few cents, annually, but the small amount is essential to those who have but little. In sections where the best silk is produced many of the shade trees are mulberry, and are called upon for a small revenue the same as if planted by the silk producer. If the owner of the trees does not keep silkworms he gathers the leaves, which have a small market value, and are always in demand.

Rearing the silkworms is attended with great care, and an amount of trouble and discomfort that necessity only would endure. At the time of hatching the eggs, the farmers' homes are given up entirely to the silkworm, and, as many of them do not have more than one or two rooms, the surrender is complete. Tiers of shelves fill the rooms, and there is barely space enough left for those in charge to feed and care for the worms. The rooms are poorly ventilated, and the stench from the moulting and excretions of the worms is horribly offensive. Yet it is all patiently endured, because necessity renders it imperative. The little cooking for the family is done out of doors, but the poor peasant sleeps upon the floor between the rows of shelves occupied by the silkworms. The tourist gets but a faint idea of the people of the country through which he passes. All admire the beautiful, well-cultivated farms, the vineyards, the long rows of mulberry trees, and more than all, the products of both. But to know a foreign country one must not devote his whole time to visiting art galleries and noble cathedrals, or antiquities, but share it with the common people.

L. A. CAROLA, Florence, Italy.

The Lower Pecos Valley.

The lower part of the Pecos Valley is in the neighborhood of Roswell and Eddy, not far north of the Texas line. Here there are broad, beautiful tracts of nearly level prairie, fit to raise any crop which can be raised in a southern temperate climate. Citrous fruits cannot be raised, but peaches, grapes, and scores of other fruits attain wonderful development there. The climate in summer is quite warm; uncomfortably so at times, in fact; but the spring, autumn, and winter conditions are wonderful. For day after day the sun shines brightly and there is no cloud in the sky, and rain rarely falls during these seasons. But there are days of cold and days of snow, and these are sufficiently frequent to prevent the thought of raising such fruits as the orange.

In the vicinity of Roswell some wonderful springs rise up out of the prairie and furnish enough water for the irrigation of many thousand acres of land. These springs are quite pure and never failing, and those who are fortunate enough to possess a right to the use of their waters are fortunate indeed; but these springs are all utilized. Extensive irrigation works have recently been constructed, and already thousands of acres are under irrigation from these canals. The Pecos itself has been curbed by constructing solid masonry dams of a very high type at a favorable point. All the best land now, however, is taken up, so that no desirable government land remains, and it is a question also whether enough water will be furnished to irrigate all the land which seems to be controlled by the extensive system of canals.

Another enterprise in the same region which is in process of completion promises excellent results. A river (the Hondo, tributary to the Pecos at Roswell) is nearly dry at some seasons of the

summer, but during the spring carries great floods of water from the melting mountain snows. Certain excellent reservoir sites exist near Roswell, and into these it is planned to turn the water and store it for use in summer. If properly completed as is planned, this will open up vast tracts of land to occupation, much of it being still government land. The question here, as elsewhere in the arid lands, is whether the local companies will swamp the farmer by excessive tax for water, and whether, also, they will fulfil their promise to furnish the required amount of water, as the irrigation laws of New Mexico are so lax that unscrupulousness is encouraged.

In the case of the Hondo the water furnished is quite free from alkali, but the Pecos contains a great deal of this very injurious ingredient. At Pecos City, in Texas, and further south on the Pecos river, the water is so salt that it is declared unfit for irrigation by the State Geologist, who has had a careful study and a series of analyses made. Whether this applies also in New Mexico I cannot say. The river is certainly less salt north of Texas, but it is even there very saline.

RALPH S. TARR, San Antonio, Texas.

Fertilizing Fruit Trees in Holstein.

Of all the various methods of manuring fruit trees, I have never seen anything so successful as the method pursued here. We have several pear trees which are over sixty years old, and there is not a dead branch to be found on any tree anywhere. The fruit is large, sound, and produced in abundance, although the trees receive no cultivation of any kind. All the care they receive is that every two years a few holes are dug in the ground, about four or five feet from the stem of the tree and about one foot deep. These holes are filled with liquid manure about four times during the winter months. For small trees the liquid is diluted with an equal quantity of water, and of course the holes are dug closer to the trees. Small fruits of all kinds, as well as vegetables, are likewise fertilized with diluted liquid manure, using an old street sprinkling wagon for this purpose. If there is more liquid manure than is required for these purposes, it is carted on the meadows, which show the effect in a very short time.

H. C. KNOOP, Holstein, Germany.

Haymaking in Norway.

In an agricultural point of view the most northerly country of Europe presents some interesting and peculiar features. The seasons, especially on the west coast, are rainy, and compel the farmer to be particularly careful in making hay. Posts, eight to ten feet high, and six inches in diameter are set in the ground perpendicularly, in rows three to four feet apart. Young juniper trees are most esteemed for this purpose. Poles from other young trees are fastened horizontally to the posts at such distances that six or seven rows are used in drying the hay, and nine or ten rows from the aftermath. These implements are called Hesjer. The price of juniper posts is five or six cents each. On a farm where twelve cows and two horses are stall-fed during the whole year, two thousand poles are used for the uprights. On the same farm the horizontals are made of well-tarred hemp rope at a price of four and one-half cents per fathom—six feet. Generally they are housed in the winter, but where they are left in the ground, galvanized iron is now in common use. The "hesjig" is woman's work. The ordinary wages paid are from forty to thirty-six cents without board. The hours of work are from half past six in the morning till noon, from half past one to half past four, and from eight to nine o'clock in the evening. In very favorable weather the grass will dry in three or four days, but as a rule eight to twelve days are needed. In unfavorable weather, three weeks might elapse, and only the outer straw will suffer, if storms leave the hesjer unhurt. As soon as the grass is put on the hesjers it is regarded as safe even in very rainy weather, but the outer part will suffer, and farmers prefer wind-dried hay. The expense of curing hay by hesjer is not much higher, than by wind-drying. If the weather is uncertain, the hay is carried to the barn on the backs of men and women.

W. B. KROHN, Bergen, Norway.

[A Norwegian haying scene is vividly portrayed in our illustration, engraved after an original photograph sent us by our correspondent.]

A NORWEGIAN HAYING SCENE.

Flower Hunting in South Africa.

Among the most striking features of the flora of South Africa are the groups of tall aloes, with their scarlet spikes, looking like red-coated soldiers; they grow in sandy patches, and near them are masses of a thick-leaved Mesembryanthemum, with pink flowers, over four inches across. They bear a juicy fruit, called "Gocum," or Hottentot fig, which is very refreshing on a hot day. In other places we find acres of ironwood (*Metrosideros*), with its red and yellow flowers arranged around the stem, like the bristles of a bottle brush. One of the most beautiful pictures that I ever beheld, and which made me forget all fatigue, was a clear stream, trickling from the rocks into a pool below, in which grew tall clumps of the Bird-of-Paradise flower (*Strelitzia regina*), with their roots in the water, and their heads in the blazing sun, and with the singular orange, blue, and yellow flowers among their great green leaves, standing straight and spearlike. In the cleft of the rocks, wet from the spray of the stream, grew luxuriant plants of *Agapanthus*, and many other species, to delight the botanist's heart. But flower hunting at the Cape has also its drawbacks. There are innumerable snakes, and the traveler has to be constantly on the lookout to avoid them. The deadly puff adder is particularly common among the thickets of some of the most beautiful flowering plants.

YANA, South Africa.

SCIENCE IN FARMING.

A Great Southern Leader in Agricultural Science.

Hon. J. S. Newman was born in Orange Co., Va., in 1836, his father being a progressive, educated farmer. The early life of the subject of our brief sketch was passed upon a farm, where he took an active part in all kinds of field and orchard work, from stock-raising and grain-growing to the care of fruit, and the making of butter. He afterward was further educated at the University of Virginia, and then taught for two years, when the war came, and Mr. Newman entered the army. Following the rebellion, he was a farmer for two years, in Virginia, and then moved to Hancock Co., Ga., where he, for eight years, engaged largely in fruit growing. From that time forward Mr. Newman has led a very active life, as may be gathered from the facts which follow. He has long been a member of the executive committee of the Georgia State Agricultural Society, and for three years Secretary of the Georgia State Horticultural Society. He was for five years State statistical agent of the United States Department of Agriculture, and editing clerk of the State Department of Agriculture for Georgia, for eight years, during which time he prepared a Manual on Sheep Husbandry; Manual on Cattle; Manual on Poultry; Manual on the Hog; Farmers' Scientific Manual, and other publications. For six years he was editor of the agricultural journal, *Southern Enterprise*, and in 1883 was elected to the chair of agriculture and directorship of the State Experiment Station, at Auburn, Alabama; in 1884 he was appointed State agent of the United States Department of Agriculture for Alabama; also elected president of the Alabama State Agricultural Society, and the Interstate Farmers' Congress. He served three years as president of the State Agricultural Society, and declined a reëlection. Since 1872 he has been a life member of the American Pomological Society, and vice-president for Alabama for eight years. He is now president of the Alabama State Alliance, and has recently been elected to the chair of agriculture, at the South Carolina (Clemson) agricultural college.

While yet in the prime of life, Professor Newman has done much more than most men. It is no easy task to point out where his greatest success lies, for, as writer, editor, teacher, he seems to have been equally at home. It may be that, as an organizer and director of other men, his talent and judgment have had their full sway. However this may be, the South has great reason to be proud of her leader in rural thought, as has the nation in the farmer and philanthropist, Hon. J. S. Newman.

Gleanings from the Bulletins.

ARIZONA—No. 4, pages 16. The object of this bulletin is to explain the terms used in chemical analyses of water, and to put before the people of Arizona some of the work done, as a preliminary to a complete examination of the waters of the territory. In the analysis the following are some of the points covered: Organic contamination, matter in suspension, matter in solution. The waters are again grouped into potable waters, irrigation waters, boiler waters, and mineral waters. The first include all used for domestic purposes, and must not contain poisonous or injurious salts or metals. It should not contain a large quantity of magnesia or free alkali of any kind. A drinking water should be as free as possible from organic matter. For irrigation, there is no objection to a water containing matter in suspension, except that, if in excess, it may clog the courses. This suspended matter may contain much fertilizing material, and thereby be a positive benefit to the land irrigated. Boiler water should be as free as possible from total solids, but here the kind of solid has much to do with the effect. Boilers are damaged by either corrosion or deposits of scale, and corrosion results from (1) action of water upon iron, especially when heated; (2) action of gases held in solution; and (3) action of gases formed by the decomposition of salts at high temperature. An ordinary analysis does not fully test for these effects. A large amount of magnesia and chlorine is a bad feature in water, unless the carbonates are large also. Mineral waters are such as have in solution certain quantities of salts, supposed to have a medical effect upon the human system.

KANSAS—No. 26, pages 22. This bulletin from the botanical department deals with smuts of sorghum and of corn. There are two species of smut that affect the sorghum plant, the grain smut, infesting the individual grains, and the head smut, which converts the whole head into a large, black mass, covered, in the young state, with a white membrane. So far as studied, the smuts attack only those varieties raised from foreign seed, or that recently imported. The head smut was first reported in this country in 1891, though known previously in Europe and Africa. Greenhouse experiments show that it is possible to infect the plants by infecting the seed with spores of the smut. Treating the infected seed with three fungicides, namely, liver of sulphur, chloride of iron, and hot water, did not fully prevent the occurrence of the smut. Attempts to infect corn by adding a quantity of the corn smut spores to the seed were not successful. The spraying of corn with Bordeaux mixture, chloride of lime, and with potassium sulphide solution did not prove effective in preventing corn smut. Three full-page plates are given of the two sorghum smuts, and their differences are apparent at a glance.

LOUISIANA—No. 12, pages 32. This is a report from the director and State chemist, upon the analyses of commercial fertilizers, under four heads, namely, (1) samples selected by the commissioner, (2) those drawn by the purchasers, (3) of samples used by the Station, and (4) samples sent by private parties. The two first groups are required by law. Only cotton-seed meal, land plaster, salt, ashes, lime, and bones, not specially treated, are exempt from the law. Bones ground to powder are, as also those treated with acid, within the provisions of the law. The nitrogen of

DIRECTOR J. S. NEWMAN.

manures is classified as follows: (a) mineral, as in nitrate of soda; (b) animal, as in dried blood, tankage, fish scrap, etc.; and (c) vegetable, as in cotton-seed, castor pomace, peat, etc. The law for the guidance of farmers and dealers in Paris green is given in full in the bulletin, and a large number of analyses is given. It seems as important that there be a State control of the insecticides as of the manures, and other States may do well to act accordingly.

MICHIGAN—No. 76, pages 16. In this bulletin there is a full treatment of the kerosene emulsion, there being several sorts mentioned with the method of making each; some are made of hard soap, others of soft soap, and still others employ milk in their composition. Last of all, there is the pyrethro-kerosene emulsion that is recommended when all other sorts have failed. A large part of the bulletin is taken up with a report of results of the emulsion for various kinds of insect pests, as for lice, ticks, and the rose chafer. Hot water for the last named depredator is treated of, and several kinds of bugs receive attention, being figured and described, such as the hollyhock bug, a currant bug, the squash bug, the oak caterpillar, white pine saw fly, and a parasite of the latter.

NEW JERSEY, Special M., pages 20. Field experiments with soil and black rots have been made, to ascertain, if possible, the influence upon the amount of these decays, of different kinds of manures and commercial fertilizers. The largest amount of black rot was upon the plat to which pig manure had been applied. The various kinds of fertilizers, as a whole, materially increase the percentage of black rot. With some exceptions, there was an increase of the black rot, along with an increase of the yield; but the greatest per cent., as a rule, was upon the plats receiving manure. The plats that received the manures also take a high rank in percentage of soil rot, three of them exceeding all others. The rotting plats are conspicuous for their low amounts of soil rot. When manure and fertilizers were both employed, it was found that kainit seemed to be a partial preventive for soil rot.

NEW JERSEY—No, 84, pages 12. Ground bone is in good repute among farmers, and in buying fertilizers they prefer a compound of bone. This has led manufacturers to name their brands falsely in order to convey the idea that they contain bone. Bone is suited to attain permanent enrichment of the soil, and cannot be well substituted by other materials. Tobacco stems contain a high percentage of potash, and, as a fertilizer are worth about seventeen dollars per ton. They are much used as an insecticide, which should increase the value.

NORTH CAROLINA—Technical, No. 3, pages 16. Under the digestibility of cotton-seed hulls, it is shown that this substance can be used with profit in feeding fat cattle. When a coarse fodder is employed, that is poor in protein, it is a stroke of economy to add some by-product, as cotton-seed meal, which is one of the very best to use, in order to get the most out of the coarse food, and feed the animal to advantage. Just how much meal should be fed varies widely. 1st. According to the ratio existing between the protein and carbohydrates of both coarse food and meal. 2d. The kind and age of animal which is to consume the food. 3d. The object of feeding, whether for maintenance, beef, milk, or work. It was determined that cotton-seed hulls alone would not keep an animal without loss of flesh. Cotton-seed hulls give a manure that is, necessarily, poor in fertilizing elements; but the meal, on the other hand, is rich in plant food elements, and enhances the value of manure from it materially.

NORTH DAKOTA—No. 4, pages 32. In the first part, this bulletin deals with potato scab, and the possibilities of prevention. The "scab" is a well-known, widely-distributed, destructive malady of potatoes, and the cause has been ascribed to many things, as mechanical irritation, depredations of insects, excess of soil water, chemical irritation, or erosion. The disease is now known to be parasitic, and is due to a plant organism of very minute character, which attacks the surface of the young tubers, and is closely related to the bacteria. This minute filamentous plant admits of artificial culture, and, when afterward transferred to healthy potatoes, invariably produces the scab, after three to ten days. In addition to the above, it has been determined that (1) scabby seed potatoes will, under ordinary circumstances, produce a diseased crop. (2) Healthy seed, in a soil free from the scab, will produce only healthy potatoes. (3) The disease germs can remain from crop to crop in the ground. (4) By soaking the seed tubers, before planting, in certain chemical solutions, undiseased products can be raised upon healthy soil, even though the scabbiest seed be used. These substances have been experimented with to prevent the scab, but corrosive sublimate has proved the best, thus far, used. This is used, one part in a thousand, and in the following manner. Dissolve two ounces of the sublimate (Mercuric bicloride) in two gallons of hot water, and pour this into a barrel containing thirteen gallons. Stir thoroughly, and after a few hours select fair seed potatoes, wash off all dirt, and immerse them in the solution for an hour and a half. The same solution can be used several times. After drying, the potatoes may be cut and planted as usual. Beets are also similarly affected with the scab, and probably it is the same organism. Beets should not follow scabby potatoes, or *vice versa*.

OHIO—No. 7, pages 28. This is a full consideration of the Hessian Fly with illustrations of the insect and its manner of working. The fly is about one-eighth of an inch long, of a dark color, and appears during May and June, and again in September and October. The eggs are deposited upon the upper-side of the leaves, and the young, when hatched, go down the plant behind the sheath near the lower joint, and then become imbedded in the soft stem, where they pass the winter. The adult appears and the eggs are deposited at dates varying with latitude, being earlier in the fall to the Northward, and later to the Southward. To prevent this pest, burn the stubble, sow late and rotate the crop. Pasturing early sown wheat in the fall may destroy many of the maggots.

FARMING IN FOREIGN LANDS.

England's yearly foreign meat bill amounts to over $125,000,000.

There was a decrease of 9,000 breeding animals imported into Buenos Ayres, in 1890.

Experiments indicate that the sugar-beet industry can be carried on profitably in New Zealand.

In Guatamala, Central America, the coffee crop is steadily increasing. It has doubled in ten years.

The number of sheep in New Zealand, in 1891, was 16,750,000, an increase of 634,000 over the preceding year.

All implements and machines for agricultural purposes are now admitted free of duty into Tunis.

New Zealand prevents horses supposed to be afflicted with glanders from being landed in the colony.

Potatoes, in Queensland, are a complete glut in the market, selling at twenty to thirty cents per bushel.

Oleomargarine sells in the open market of Cape Town, South Africa, as butter, at thirty-one cents per pound.

There is a large increase in the use of tobacco in Germany, which seems to be the case pretty much all over the world.

South Africa gets an importation of forty-five Merino rams from Cornwall, Vt., the enterprise of Mr. Charles R. Witherell.

Canadian butter, shipped to Liverpool in tin-lined kegs, arrived in good condition and was classed as superior to Cork "seconds."

A French chemist has exhibited a process for making silk out of wool fiber. The new silk is said to be strong and to take dyes well.

South Australians urge more constant inspection of cattle, also the prevention of the sale of milk and meat from diseased animals.

In Cohauila, a Central America state of only 184,327 inhabitants, the increased manufacture of ixtle fiber, amounted to $64,693 during 1891.

On the estate of Lord Lurgan, county of Armagh Ireland, 808 tenants bought their farms, for $1,100,000, the prices ranging from $150 up to $15,000.

A man in Sydney has $250,000 invested in city property, all of which was made out of pigs. He never passes a pig without taking his hat off.

In Somersetshire, England, over 80,000 acres of moorland have recently been flooded, leaving a large number of farmers in utter destitution.

Latest New Zealand census returns give the output of butter at 16,000,000 pounds, double what was made ten years ago, and the cheese product was 7,000,000 pounds.

South Australians use coal oil cans filled with concrete for weighting silos. A loop of wire is inserted into the soft concrete, thus affording a handle to the weight.

There has been a good market, in Melbourne, for fine poultry. One lot of six birds, Wyandottes, Plymouth Rocks and Langshans, sent from New Zealand, sold for $47.50.

New Zealand exports have recently shown a decrease in wheat, flour, hides, potatoes and other produce; but wool, hops, frozen meat and rabbit skins showed an increase.

At Edendale, Scotland, a flock of Lincoln and Leicester cross-bred ewes put to Shropshire Down rams returned 125 per cent. of lambs. At Glenham the percentage was 100 per cent.

France, Austria, and even Russia, supply England and Germany, with enormous quantities of eggs. Yet France consumes, *pro rata* of her population, more eggs than any country in Europe.

Foot and mouth disease made terrible ravages in Germany last year, attacking 432,235 cattle, 230,868 sheep, and 153,808 swine. Pleuro-pneumonia was not so rife, only 626 cattle having been attacked.

Belgium has suffered loss in wool spinning during the past two years. England was its principal market and the demand fell off, owing to a change in fashion from combed to carded woolen goods.

Fiber cultivation appears to be well established in the Bahamas. There are over 6,000 acres under cultivation and the maturity of the sisal plant takes four years. The first exports will be during the present year.

The commercial traveler is not especially demanded in Brazil. Experience indicates that the best method for American merchants is to send goods to Brazil and compete with other merchants for trade.

Pleuro-pneumonia is nearly extinguished in Great Britain. Only four diseased animals were killed during the week ending November 21, 1891, while 242 were slaughtered because they had been exposed to the contagion.

European authorities should carefully inspect Russian live stock of every kind, as the markets are being flooded from that unfortunate country, with half-starved animals, that are specially predisposed to contagious diseases.

The coffee of Nicaragua is greatly improving in quality. It is far superior to Brazilian coffee. In the department of Matagalpa, there are 2,000,000 acres which will soon annually produce ten million pounds of superior coffee.

The peculiar conditions of dairying in the Northwest are well set forth in the "Proceedings of the North Dakota Dairymen's Association," especially in President I. C. Wade's excellent address. The secretary is E. F. Ladd, of Fargo.

The brandy and champagne industry of Austria grows so fast that it is becoming a rival of France. To counteract the spread of the *peronospora*, Parliament has granted to wine growers the importation of blue vitriol free of duty.

Large wheat seed, weighing sixty-four pounds to the bushel, in four separate sowings in England, was the first to sprout, was taller, made better growth, and averaged ten bushels per acre more than the smaller seed that weighed only forty pounds.

Shipments of butter from Victoria, Australia, to England, largely increased last season and are expected to amount to 2,000 tons, double the quantity of the previous year. There are 263 creameries in Victoria, the largest having a weekly output of forty tons.

There are more ducks in the Chinese Empire than in all the outside world. They are kept on every farm, on the public and private roads, in city streets, and on lakes, ponds, streams and brooks. A good duck-farm should pay well near San Francisco.

The manufacture of cream of tartar and tartaric acid from grape pomace, and wine lees is described by Louis Paparelli in a very useful little pamphlet. It should be spread broadcast in the grape-growing sections of the country. Sold by the Orange Judd Co.; price 20 cents.

Wheat has been firm all over Europe. In London, American meats sell at a fair ratio with home-killed, and our fat cattle bring fairly good prices. There was an advance on American cheese. If our cheese manufacturers would send thoroughly ripe cheese to foreign markets, prices would range much higher.

One of the best proofs of French economy is the general use of conglomerate fuel. Fuel is dear in France, and they use briquettes or little bricks of coal dust, which are clean, do not waste, are easily handled, occupy ten per cent. space, are good fuel, and burn freely where coal dust could not otherwise be used.

In England the acreage and crop of hops is large. In the Worcester district it is 50,000 to 55,000 hundred weight. There is a great difference in the hop acre and the statute acre. Five statute acres are equal to eight hop acres. In many parts, great difficulty in harvesting and securing the crops has been experienced this year.

Berlin, in extending its sewage system toward the suburbs, built walled canals, and laid earthen pipes and forcing apparatus, by which means more than 8000 acres of land are now irrigated and fertilized. The cleansing of great cities by this method is eminently practical, as well as beneficial from a sanitary point of view.

The Hungarian minister of agriculture contemplates utilizing the large sandy plains of the country for the plantation of vineyards, and it is proposed to plant 40,000 acres with vines imported from the United States, as these have hitherto defied the phylloxera. The vine growers of all Europe are dependant upon America.

The Imperial decree, forbidding all exportations of rye from Russia, is the most significant act of that government for many years. It deprives Germany of eighty-five per cent. of her accustomed supply of rye, and fifty-five per cent. of that of wheat. The next largest growers of rye can supply Germany only one-fourth of her requirement. This shows the importance of Russia in agricultural productions, where the utmost products of Roumania, France, Servia, European Turkey, the United States of America, and Canada, united, can supply only a quarter of the quantity that Germany requires.

Worbled hides at the winter show in England attracted much comment. The larvæ of insect nuisances produce a large amount of damage to hides, as they appear on the back, or in about the center of the hides. A drop of pure carbolic acid deposited in them with a hypodermic syringe, quickly destroyes the larvæ, and absorption soon takes place.

The cause of the great agricultural distress in Austria is attributed to the difficulty of obtaining prompt credit by the farmers. The rate of interest perpetually fluctuates, and is generally too high to be met, not only by small farmers, but also by those who hold large landed estates. No farmer can pay twelve per cent. interest and keep a roof over his head.

The unreliability of weight guessing, which is so patent to Americans, was recently shown at a Scotch fair. Farmers handed in 160 guesses as to the weight of two fat bullocks. None were correct, the nearest being three pounds out on one and seven pounds out on the other animal, while some experts accustomed to handling cattle were over 200 pounds wrong.

England, France, Germany, and Belgium, seem far more cognizant of the rapidly growing commerce of Mexico than the United States. Our proximity, our reputation for smartness in trade, yield to the commercial tact of Europe. If we would compete hopefully in Mexican tradê, we must send active, skilled canvassers, who speak the language of the country.

A shipment of horses was recently made from the Argentine Republic to Dublin, Ireland. They were four to six years old and from 12.2 to 16.1 hands high, some being Clevelands, others Norfolk trotters and a few by American trotters. They had little or no care on the voyage, and were not the most promising lot when brought to the hammer. Bidding was spirited and prices ranged from sixty-five up to one hundred and eighty dollars each, the average run for sound animals being ninety to one hundred and ten dollars.

Australian fanciers are paying good prices for choice poultry. A Dorking cockerel, that won the Lord Mayor's cup, at Derby, and the challenge cup, at the Crystal Palace, England, was sold to J. McCulloch, of Victoria, for $375. The pullet to match sold for $175. A prize game pullet sold for $105. A small advertisement in the AMERICAN AGRICULTURIST would probably attract the attention of our many Australian subscribers to the breeding of fancy American stock. Quite a trade has already been built up in this line, the poultry being shipped direct from San Francisco.

American stock-raisers might keep an eye on the market of Honolulu, Hawaiian Islands. Heretofore not much attention has been paid to the quality of the stock there, although the climate, in some portions of the Islands, is well adapted for breeding purposes. The shipment from England of a yearling Shorthorn bull and heifer to Honolulu indicates a change in the right direction. Surely American breeders should be able to compete with England, as we have the advantage of short shipment by rail, and seven days by sea, whereas English live stock exports must be at least four months on the water, unless coming across the Atlantic.

The McCormicks are about the only American manufacturers of harvest machines who have made persistent efforts to introduce their harvesters into Russia. The grain-growers there are so wedded to their cheap hand labor that sales have proved very limited, and the trade in Russia is not increasing, while English manufacturers have been unable to get any foothold whatever there for their harvesters. There are no harvesting machines to speak of in India, though their use is increasing in Australia and New Zealand, also in England, and more American harvesters than usual are being used in Roumania, France and Germany, with recent sales in Italy and Spain. Of course, if the American farmer can continue to harvest his grain with machines, he can compete with even the pauper labor of Russia and India.

To Prevent Maple Sugar from Crystallizing.—Mrs. P. H. Kingsley, Warren Co., Pa., writes us she has found that, after having sealed the cans hermetically, if they are shaken from time to time when the syrup is cooling, it will never crystallize.

Apple Pomace.—Elias Gates, Greene Co., N. Y., writes us: "I have a chance to buy a large quantity of apple pomace. I would have to haul it only half a mile. What is it worth?" It is well worth drawing that distance, but not much more. Spread it on grass land, or in the orchard, and let the pigs see if there is any food left in it that they want. It will make good manure.

Wistaria Multijuga.—A Reader, Rochester, N. Y.: Your patience may have been sorely tried in waiting for this plant to come into bloom, but we can assure you that the racemes of flowers of this species are as represented, and from two to three feet in length. Our oldest plant has bloomed every spring for several years past, and we have been greatly pleased with this fine addition to our collection of hardy climbers. The plants seem to be rather tardy in coming into bloom, but this fault may, perhaps, be overcome by grafting upon other species, and using cions from old blooming plants of the *multijuga*, a name which is quite appropriate, as it means many-paired, referring, no doubt, to the number of flowers on a raceme.

Fall Plowing.—H. H. Campbell, South Dakota: The object of leaving fall-plowed land with a rough surface, and not harrowed down smooth, is to facilitate disintegration and the breaking down of lumps, permitting the ingress of air, frosts, and rains, the action of these elements being more rapid and certain than on a compact soil. If you will place a lump of soil on the surface, and leave it there through the winter, you will find it has crumbled away, each particle, during the process, probably, having come in direct contact with the air. This aeration has not only changed the form, but separated the particles, perhaps bringing two in contact that never touched before, all of which affects the soil chemically as well as mechanically. The object of breaking up the soil, or cultivation, as we usually term it, is not only to eliminate noxious properties by aeration, but to change its mechanical structure and prepare it for the reception of the seeds of domesticated plants. Heavy soils require pulverizing, to admit air, and the escape of surplus moisture by evaporation or drainage, while very light soils may need compacting to put them in proper condition for the reception of seed.

Fruits for Illinois.—J. D. L., Clinton Co., Ill.: We believe that it is generally conceded that the American Pomological Society is our best authority on the varieties of fruits adapted to the different States of the Union, and, in answering your question, we have merely to copy the names from the catalogue of the above named society. The earliest summer apple, Early June; the best keeping winter apple, Rawle's Genet. There may be others just as early and as late, but the two named are highly recommended for Illinois. For three freestone peaches, early, medium, and late: Hale's Early, Old Mixon Free, and Smock. It would probably be better to plant more than one variety for each season.

Potatoes for Pigs in Oregon.—A. A. Bonney, Wasco Co., Oregon, asks, 1st, "Would a 200 bushel crop of potatoes be of much value as food for hogs?" We do not think potatoes, where the yield is not over 200 bushels per acre, would be a good crop to plant for feeding pigs. They are a heavy crop to handle, and the cost of planting and digging an acre, even with the most improved machinery, is greater than planting and harvesting an acre of corn. Land that will produce 200 bushels of potatoes would probably produce sixty bushels of corn, and the pigs, especially if they had the run of a good pasture, would much prefer the sixty bushels of corn to 200 bushels of raw potatoes. 2d. "How would it do to turn hogs into the field, and let them do their own digging?" If the ground is moist and loose, and the pigs have good snouts, and you have pigs enough to eat up all the potatoes before frost, this would be a good plan. But raw potatoes, alone, are poor feed for hogs, especially in the fall, when they are hardly ripe, and are full of crude sap. They are much better in the spring. If you turn the pigs into the potato field, you should give them some other food, in addition to the potatoes, such as mill feed, corn, peas, etc. 3d. "Fed in this way, how do they compare with Jerusalem artichokes, fed in the same way?" There is but little difference in the nutritive value of potatoes and Jerusalem artichokes. 4th. "How compare as food for mutton sheep?" The sheep will not dig either the potatoes or the artichokes. For sheep you had better grow turnips or mangel-wurzel.

Birds and Flowers.—J. B., Long Island: You cannot make much of a show in cultivating trees on a plat only 50x100 feet, but you have room for many shrubs and herbaceous plants. As you say you cannot afford to buy, but have access to woods and fields, there is no reason why you should not secure a good collection of native plants. Dig up the shrubs and other plants in early spring and plant them carefully. There will be no difficulty in making them grow, but in transplanting the shrubs, it is best to prune off a part of the branches at the time, no matter how many roots they may have. If you want a few trees, select small ones for transplanting. Consult some good standard book on birds for the names and habits of the thrushes. You can find these works in the free libraries. We will say, however, that the song of the "Hermit Thrush" is as sweet as that of the "Wood Thrush."

Impure Water.—Miss M. D. K., Hampshire Co., Mass.: We have examined the yellowish powder you obtained by boiling down six quarts of water from your well, and find it is principally oxide of iron intermingled with clay. We do not think it would be injurious to the health of the persons using the water; still, impure water is not a pleasant article to use. It is probable that this yellow clay comes from the surface through some hole made by moles or rats, and, during showers, a larger or smaller quantity runs into the well. Search the ground over carefully and see if you cannot find where the clay comes from.

Healthy Meat.—L. M., Brooklyn, N. Y.: First quality of meat should be of a bright, red color, well mixed with white fat; firm and elastic in consistency, and possess an agreeable odor. Jersey steers and young heifers have a yellowish fat and good colored flesh. Beef of the second quality is not so bright a red in color, nor so evenly mixed with fat, and is less plump in fiber. There is a difference in the meat of animals which have been fed only on one kind of food. Corn, alone, makes solid pork or beef, but a variety of food produces the best, healthiest, and most tender meat.

Save the Trees.—S. Hitchcock, Orleans, Co., Vt.: deplores the fact that so many forest trees are going down before the ax of the lumbermen. Still more deplorable is the destruction of trees on farms. Small clumps of trees, and single trees along fences, add much to the value of the farm, not to mention the comfort they afford to cattle by providing shade for them in the summer time.

What to do With Bones.—L. A. Buckner, Chicot Co., Ark., writes us: "I have a considerable quantity of bones, and have no way to grind them or exchange them. Would you advise burning them, and then mixing with acid?" No. You would find it more work than profit. You can buy superphosphate cheaper than you can make it. Break up the bones with a hammer and bury them under grapevines, fruit trees, or roses, or mix them with the manure in your hotbed, or manure pile. Or make them into a compost with cotton-seed cake, and manure, and superphosphate. Make the pile where water is abundant and convenient. The pile will get very hot, and must be kept moist. It takes far more water to do this than any one, who has not tried the method, would be likely to suppose. With plenty of moisture, the acid phosphate will retain all the ammonia. If any of the bones are not sufficiently reduced, throw them into another pile, and ferment them again. You can use superphosphate freely, as it is not lost or injured by the fermentation. We should use about the following proportion: 1st. One ton manure, 200 pounds bones, 50 pounds superphosphate. 2d. One ton manure, 200 pounds bones, 100 pounds cotton-seed cake, and 70 to 100 pounds superphosphate. Mix well together, and be very careful to keep the heap moist. It will get hot enough to cook eggs! If you can detect the escape of ammonia, sprinkle superphosphate on top of the heap, and wash it in by pouring on more water. But we do not think any ammonia will escape.

Pruning Red Raspberries.—B. Davis, Johnson Co., Ind.: When the plants are set out, the canes should be cut down to within six to eight inches of the ground. If the plants make a good growth the first season, or from three to four feet, as usual with such varieties as the Cuthbert, about one foot of the top may be removed the following spring. If there are any strong lateral branches, cut these down to within four to six inches of the main cane. As soon after the fruit has been gathered, as convenient, cut out at the ground all the old fruiting canes, in order to give the new ones, which are to bear fruit next year, a chance to grow, and the leaves to be fully exposed to the light. The old canes are of no use after they have produced fruit, and the sooner removed the better. As the Cuthbert produces an immense number of suckers, a large proportion must be destroyed; six to eight canes for each hill or stool is enough. The second spring the young bearing canes should be cut back, as well as the side shoots, but the pruning must be varied according to the length and vigorousness of the canes, and whether tied to stakes, or left without such support. Three to four feet is the usual heigth for strong growing varieties.

Blood as a Fertilizer.—J. Lanchet, Oklahoma Ter.: Blood in its natural state contains from two per cent. to five per cent. of nitrogen, and, when dried, from six per cent. to fourteen per cent. It makes an excellent manure for all kinds of crops, especially on light soils. It is most advantageously used when composted with muck or soil.

Sowing Wheat without Plowing.—A. W. Litchwood, Allegany, Co., N. Y., writes us that he usually plants about twenty acres of potatoes a year. After the potatoes are dug, he rakes up the vines with a horse rake, burns them, and then, with a spring tooth harrow, goes over the ground until it is mellow and level; then he puts on a roller, preferring to roll the ground before sowing to using the roller afterwards. The advantage of not plowing the ground is that it remains harder, and, on sandy soil, it is almost impossible to get the land too hard. The wheat is drilled in, and, since adopting this method, Mr. L. states that he has had much better success than formerly when he plowed the ground.

Dry Silage.—J. T. Smith, Linn Co., Iowa, has, after losing a good portion of his green silage, adopted the following plan, which has proved perfectly satisfactory:—"I shock my corn at the proper time; after about a month, haul it to the silo and cut it up, ears and all. I do not wet it or pack it, only keep it level and do not cover it with boards or weights. We can cut as many stocks of dry fodder as of green, and it does not cost as much to make a silo for dry silage as it does for green, as it need not be air-tight and tar papered. I feed bran and oil meal with the fodder, together with uncut oat hay. My cattle relish this feed exceedingly, and my butter sells at an extra price to private families."

Barley Meal for Pigs.—George W. Culver, Cayuga Co., N. Y., asks: "What shall I add to barley meal to make a properly balanced ration for pigs?" Nothing, except you have some food that the pigs like, which you want to feed out. When potatoes were cheap we have steamed many hundred bushels, and mashed them up, while hot, with barley meal. Potatoes are a carbonaceous or starchy food, but the pigs liked the mixture, and fattened rapidly on it, and made pork of first-rate quality. On the other hand, when potatoes were high and mill feed cheap, we have fed mill feed and corn, or barley meal, with excellent results. Mill feed, or bran, is a nitrogenous food. We have fed peas largely, and corn still more so. We have thought that the pork was firmer when peas were fed. Otherwise, though peas are highly nitrogen-

ous, and corn highly carbonaceous, the pigs do about as well on one as the other, or both. Let the pigs have a good pasture to run in, give them skim milk, buttermilk, whey, or slops from the house, and, so far as grain is concerned, it will make little or no difference whether you feed wheat, barley, oats, rye, corn, or peas. So far as food is concerned, one is about as good as the other, corn, in our judgment, being the most nutritious, and, as a rule, certainly much the cheapest.

Free Instruction in Live Stock Husbandry.—The Purdue University, La Fayette, Ind., has arranged a special winter course in Live Stock Husbandry, including Dairying and Veterinary Science. This special course of eight weeks will be devoted to giving instruction by lectures and by direct work in this distinctive line of agriculture. Applicants for admission must be at least sixteen years of age, and must have a good common school education. The tuition will be free. This offers an excellent opportunity to young men, who intend to devote themselves to stock raising or dairying, and who are unable to attend the entire college course. Circulars giving full information may be obtained by addressing Prof. C. S. Plumb, La Fayette, Ind.

A Good Disinfectant.—No matter to what degree of cleanliness the henneries, barns, stable or cellars may be kept, or however well-aired or ventilated, still, to maintain perfect health of persons and farm stock, the use of disinfectants will be occasionally necessary. The following costs about fifty cents per bushel: Air-slaked lime one bushel, copperas (sulphate of iron) one pound, crude carbolic acid one-half pound. Mix thoroughly and keep in a covered barrel or box. After cleansing, sprinkle about floors, corners and cracks of stables. Rats do not like it.

Converting Dead Animals into Manure.—S. Hurley, Ontario, Canada: The best way to convert farm animals that have died on the place, or have been secured otherwise, into fertilizers is to cover the carcasses with a sufficient quantity of muck, sods, or soil to the depth of two or three feet. If the carcass is cut up into pieces, the decomposition will go on more rapidly than if left whole. If dogs abound in the neighborhood, it will be necessary to provide some kind of frame covering to prevent the dogs from digging out the dead animals. Of course, the further away from a habitation the compost heap is made the better. It will require about a year's time for the decomposition of a dead horse or cow.

Tethering Cattle.—N. W. Price, Washtenaw Co., Mich., writes us that an easy, safe, inexpensive, and practical way of tethering cattle is to take a good strong wire of any desirable length, from fifty to two hundred feet. Place on this a ring, drawing the wire tight, and stake it firmly at each end. To the ring is attached a tether which may be of any desired length, and to which the cow is tied; thus the cow will have for pasturage twice the length of the tether. If the tether is thirty feet long, and the wire two hundred feet, it gives the cow a range of over one-quarter of an acre of ground.

Dairy Interests of North Dakota.—Colin C. Thomas writes us from the James River Valley, N. Dak., that the dairy products have risen rapidly in value, and from no inconsiderable portion of the farmers' incomes. The native grasses are very rich, and produce more butter and cheese than most of the cultivated grasses in other States. The live stock interest is receiving more attention every year, and the business is proving safe and profitable. The Western portion of the State is naturally a live stock country furnishing pasturage all the year round.

Lawns and Sidewalks in the Country.—George R. Knapp writes us: "Would you advocate the adoption of local lawns in country towns and villages, making it compulsory for property owners to have some sort of sidewalk in front of their property?" We are not sure that we know what is meant by "local lawns," but we are in favor of all good lawns, and are pleased to know that American farm lawns, and village lawns, and city lawns are yearly becoming more general. We live in the country, and a farmhouse without a lawn is the exception. The lawn mower has done great things for us. Country sidewalks will come in time. The social law, the law of good fellowship, and good neighborhood, and good feeling, will be better than the law of "compulsion." See that your own lawn and sidewalk are what they should be, and that will encourage others to follow your example. A law might work well where there is sufficient public spirit and good taste to make the lawn and sidewalks, without law; but our country roads show what the law can do for us. Path masters are too often appointed for political reasons, rather than for knowledge of the principles of road making. Lawns and sidewalks, in charge of the average path master, or fence viewer, might be better than nothing. And so, if the people want the law, we will not object. It can do no harm, and may do some good.

Forging or Overreaching.—James J. Higgins, Flemington, N. J., desires a remedy for the forging. There are two methods that will probably succeed to a goodly degree. Try first one, and then the other if necessary. Make the fore shoes a third or more heavier, and without caulks so that the hind shoe may not catch in them and throw the horse. The extra weight will have a tendency to make the horse pick up his fore feet quicker. The hind shoes should also be without calks, especially toe calks. The second method is to remove the hind shoes for a time, till the habit is corrected. Remove the check rein. It may have some effect in correcting the annoyance. Often, horses tortured with a severe check rein forge.

Wistaria. Not Wisteria.—H. Reader, Rochester, N. Y.: We do not know why some nurserymen and correspondents of the agricultural press will continue to misspell this old and familiar word, but they do it, hence your inquiry, accompanied by a description of a very old and large specimen of this vine in Connecticut. The genus *Wistaria* was named after Prof. Caspar Wistar of the University of Pennsylvania, and by Thomas Nuttall, early in the present century.

Apple Scab.—Subscriber, Charlotte, Vt.: The disease to which you refer under the name of "black mildew," is probably the one known as "Apple Scab," also by the scientific name of *Fusicladium dendriticum*. Mycologists, however, have found more than two hundred different species of fungi attacking the apple-tree or its fruit, and from this vast number, it would be rather difficult to recognize any one from a mere local name. The apple scab, which affects the fruit very much as you describe it, is so very common in all parts of the country that we do not hesitate to pronounce it is the disease with which you have to contend. Prof. J. Lamsen Scribner, in the report of the United States Department of Agriculture for 1887, recommends spraying the trees thoroughly in early spring before the buds have commenced to expand, with a solution of sulphate of iron, using four pounds of the iron to four gallons of water. Repeat the application three times, the second time as soon as the fruit has set, and the third, two or three weeks later. Those who have tested such application, report excellent success in preventing the apple scab.

Late Sown Wheat.—J. Kidder, Lorain Co., O.: We cannot inform you who discovered that late sown winter wheat would escape injury from the Hessian fly. But it was certainly none of the present generation of entomologists, for in a "Farmers' Dictionary" published in the last century, viz. 1790, it is recorded that "yellow bearded wheat sown late in autumn, escaped the Hessian fly," and this was not original, but copied from Morse's Geography.

Care of a Young Filly.—C. M. Greaves, Vancouver's Island, B. C., has a fine filly seven months old, and wishes to know how to feed her so as to have her grow as fast as possible. Feed well-shaken hay, to get all the dust out, night and morning, just enough for her to eat it up clean in an hour or so. Commence with a pint of clean, sound oats with a quart of good, smut-wheat bran three times a day. A finely-cut mangel added to the noon feed will keep the bowels in a good condition. Daily grooming with a brush will keep the skin healthy. Give her water, with the chill taken off, three times a day. Once a week, throw a small handful of flaxseed into the night feed. Gradually increase all the feed. Give plenty of outdoor exercise. Keep in a warm, airy box-stall well littered with clean straw and clean the stable daily. Handle the filly gently every day; accustom her to bridle, saddle and harness. Lift each foot every day, and treat her to the kindest care. Accustom her to the sight of blanket, robes, whip, wagon, sleigh, bells and everything to which she may be exposed. Teach her everything patiently, as a horse is not precocious like some spoiled children. Never require her to attempt to do what she has not been thoroughly taught to know. Never overdo anything. When she is two years old she will be well broken to any kind of proper use.

Raising Melons Under Oiled Paper Boxes.—A correspondent at Ogden, Utah, writes us: "I am a New York State farmer, and came to this place recently. My attention was called, last summer, to the high price of the first musk melons—say fifty cents apiece. Is it not prnacticable to get them two or three weeks earlier by planting the seed that much earlier, and protecting the plants by boxes covered with oiled building paper? Would the boxes have to be removed every day?" Plants must have abundance of sunshine, and it would be necessary to remove the boxes every day. Some thin cotton cloth would be better than the oiled building paper; but the best material for the purpose is the plant protector cloth. It would protect the plants from a slight frost, and would admit more light. Merely planting the seed two or three weeks earlier than the usual time, and covering the plants with paper or cloth, would certainly not give melons two or three weeks earlier. Two or three days would be more likely.

Hard Milker.—Geo. A. Hall, Paulding Co., O., has a hard milking cow and desires to know how to make her give down her milk. Gentle treatment, good liberal feeding, and rubbing the udder downward with lard in which a small quantity of extract of belladonna is mixed. A drachm of belladonna to a pound of lard. Apply a piece to the palm of the hand, rub the palms of the hands together, then stroke the udder downward with firmness for a few minutes before milking. Feed the cow before milking or applying the ointment.

Free-Martins.—A. P. W., Uinta Co., Wy.: The female calf of the twins, when the other is a male are called free-martins. They seldom breed. Both are liable to be imperfect animals from defect or absence of some of the organs. The heifer-calves of such births are more liable to be hermaphrodite.

Mice Around Fruit Trees.—H. T. B., Long Island: We have never tried lime or ashes as protection for young fruit trees against mice; consequently cannot say from experience how these substances should be applied, but presume they are banked up about the stems in the fall. Having found common tar paper an effectual preventive against both mice and rabbits, and it is so cheap and readily applied withal, that we have never had an occasion to make a change. We think that coal ashes would answer as well as wood ashes, and slate lime would certainly be preferable to stone lime, as the latter might injure the trees if thrown against the bark. The only practical way of getting rid of the white daisies, is to break up the sod and keep the land under cultivation until all the plants and seed are destroyed. But, if you allow any plants to go to seed on your farms, or your neighbors do so on theirs, you will soon have a new crop to contend with. A farmer who has good neighbors, has cause to be thankful.

Safety Tether for Colt or Horse.—P. Howard Baker, Norfolk Co., Mass.: If there are no trees or branches of trees high enough to stretch a strong rope ten to thirty feet horizontally and high enough for the colt to pass under, then strong stakes of the proper height set in the ground must be used. Over the rope, so fastened, slip an iron ring large enough to tie the halter in so that it will slide from end to end of the taut rope, and the colt can reach the ground when under the rope. If the halter cannot be reversed so that the halter rope is in front of the nose, then a ring or tie should be fastened to the front of the nose-piece. When under the chin the colt's foot is too easily put over the rope. The posts can be moved to new grazing as often as necessary. There are a great many horses injured, frightened, or permanently lamed by being improperly tethered to grass. The great danger in such cases is that the rope gets over the hind foot when a spirited or nervous horse kicks violently to free the foot, either cutting the fetlock or ankle below, or he gets violently thrown.

THE AGRICULTURAL REVIEW.

An Eastern Opinion.

F. C. BURROUGHS, CONNECTICUT.

Two articles from Western men who advocated in part the demands of the Farmers' Alliance appeared in the AMERICAN AGRICULTURIST for August, page 462. I am glad the AMERICAN AGRICULTURIST is allowing the West a voice in the very broad discussion it has been carrying on the past year. I hope it will allow one of the farmers of the East a brief word also.

The great demand on which all Western farmers seem agreed is that we must have more money in circulation. This demand arises not merely from the fact that money has been scarce or tight—less scarce than tight, perhaps—during the past year, but from other causes as well. People think there used to be more money in circulation than there really was. They think there is less in circulation now than there really is. Hence, under title of "The Kansas Idea," A. R. Moebius says (page 462), "The alleged dangers from inflation are all bosh. Our wealth producers neither suffered nor complained when the circulation was $52 per capita." And W. H. Smith on the same page says, "The report of the United States Secretary of the Treasury, Nov. 1, 1889, shows money in circulation amounting to $1,387,351,825, and deposits in National banks of $1,950,935,161. Assuming deposits in State and private banks to be as much more, we have in round numbers four billions of money. Of this amount one-fourth must be held as a reserve fund to secure depositors, so that we have less than four hundred millions, or about seven dollars per capita actually available as circulating medium."

First, as to Mr. Moebius's statement that at one time there were fifty-two dollars per capita in circulation. The period of greatest circulation probably came in 1865. I have no data for July 1st of that year but, according to James A. Garfield, "the amount of paper money in the United States" on Jan. 1, 1865, was $948,000,000, and one year later $919,000,000. Besides this, there was about $200,000,000 in coin, nearly all of which was held by the banks or owned by individuals, who used it only to speculate with. If we consider that three-fourths of it had its uses as money it will swell the $940,000,000 in paper to $1,085,000,000, or about $1,050,000,000 exclusive of what was in the treasury. This would be about thirty dollars per capita. Possibly Mr. Moebius did not consider the South as having any part in using this money.

In considering the large circulation of 1864 and 1865, we must remember that it was a war-inflated circulation, doing a war-inflated amount of business, at war-inflated prices. It then took nearly two hundred dollars to transact a business that one hundred dollars would have done in 1860 or in 1890. At times one hundred dollars in gold would have purchased as much as two hundred and fifty dollars in paper. If we reduce the thirty dollars per capita to a gold basis it becomes about twenty dollars per capita, or thirty dollars per capita if the South is excluded.

Now, as to Mr. Smith's statement that there were "about seven dollars per capita" available circulating medium in 1889. There is certainly a very grave error in Mr. Smith's method of computation. He first states that there is $1,387,000,000 in circulation. Further down he supposes that the National, State, and private banks have on deposit "in round numbers four billions of money," and right here is where his error lies. Whatever their total annual deposits may have been, the books of the banks never could have shown that amount of money on deposit at any one date, as it is nearly three times the total amount of money then in circulation ($1,387,000,000). But Mr. Smith, I think, takes one-fourth of the four billions, thus getting one billion as about the amount the banks must hold all the time to comply with the law. One billion or one thousand millions taken from the thirteen hundred and eighty-seven millions leave "less than four hundred millions, or about seven dollars per capita." This, I think, is Mr. Smith's process.

In the New York *World* almanac of 1891 are statistics which show that the National banks held $307,000,000 of Uncle Sam's moneys in July, 1890. Statistics from other sources for other dates show that this is a fair average amount of the money in the National banks. Turning to the *Tribune* almanac of the same year we find that $185,000,000 is given as the "Cash and cash items" held by "all State banks, loan and trust companies, and savings and private banks" in 1890. "Cash items" are not cash, but since the amount of such items would be small comparatively, let the whole go as cash. Add this $185,000,000 to the $307,000,000 in the National banks, and we have $492,000,000 as a fair average of the money held in all the banks of the country in 1890. Supposing the amount to have been the same on Nov. 1, 1889, there would have been on that date not "less than four hundred millions," but about 900,000,000, or $14.52 per capita in the hands of the people. Notice that the National banks hold from one-fifth to one-fourth of the total circulation, while all the other banks hold only a little over one-eighth.

Following is a table showing the per capita at different dates. The authority, either for the per capita itself or for the circulation from which it has been computed, is given in a parenthesis at the right:†

Date.	*Per capita.*	*(Authority.)*
1833.....	about $ 9.00	(R. Q. Mills).
1837.....	" 14.50	(R. Q. Mills).
1850.....	" 11.43	(R. Q. Mills).
1860.....	" 15.49	(R. Q. Mills).
1860.....	" 13.85	(recent Treasury report).
1864-'65.....	" 30.00	(Garfield and R. G. Horr).
1865, July 1..	" 20.82	(recent Treasury report).
1870, Oct. 1..	" 19.98	(Treasury report, 1890).
1878, July 1..	" 16.33	(R. G. Horr).
1880 " 1..	" 20.26	(Treasury report, 1890).
1885 " 1..	" 23.02	(recent Treasury report).
1889, Nov. 1.	" 22.37	(Treasury report, 1889).
1890, July 1..	" 23.24	(Treasury report, 1890).
1891. Jan. 1..	" 24.10	(recent Treasury report).
1891, Aug. 1.	" *23.37	(recent Treasury report).

*A decrease on account of recent gold exports to Europe.

The reader will observe that in the above list two per capitas are given for 1860, and two for 1865, which do not agree. Possibly the present Treasury officials have reduced the paper circulation of 1860 and 1865 to a gold basis. The "recent Treasury report" says that all statements are "made on precisely the same basis." Since everything is on a gold basis now, for comparative purposes it would be fair to reduce the paper circulation of the past to a gold basis also.

The foregoing per capita list alone tells much, but since the farmers of the country really desire to go to the bottom of things I add a rough historical sketch of the currency question, beginning with 1833.

1. From 1833 to 1837 there was the most rapid peace expansion of the currency (largely poor paper) in the century. It was an age of speculation, followed by the very worst of panics and hard times, 1837 to 1841.

2. After a period of contraction prosperity returned in 1843 and continued, with some increase in circulation, during the Mexican war and after.

3. After 1850 came another paper expansion period, with flush times for awhile and then a general stirring up in financial circles in 1857. Slight contraction followed this, and by 1860 the country had become quite prosperous again.

4. War circulation and war prosperity.

5. The period, 1865 to 1878, was in general one of contraction, in the midst of which came the crisis of 1873. More or less hard times followed until after the resumption of specie payments in January, 1879.

6. Expansion began again in 1878, the per capita list given showing its course very plainly up to the present time. But it has been coin expansion.

Our Western friends may attribute the prosperity they enjoyed from 1881 to 1883 to the rapid increase in circulation which preceded it. But if a circulation of twenty-one dollars per capita in 1881 was sufficient to inaugurate a boom why, will they tell us, did a circulation of twenty-three dollars per capita in 1887 inaugurate a period of depression?

What does all this prove?

It proves that there is more money in circulation now than ever before, if reckoned from a gold basis, and that, including exports of gold to Europe (which are likely to come back for grain this fall), the per capita is still increasing slowly.

It proves that there is danger in too great or too rapid expansion, especially in paper expansion not convertible into coin. And why coin? Because coin can be carried in the pocket, is not easily destroyed, and changes in value very slowly, and because, too, it is the only standard any government ever used without bringing disaster in the end.

†The Secretary of the Treasury at Washington published August 29, 1891, for free distribution to all applicants, a pamphlet entitled "The volume of money in circulation." In these tables the difference between the amount of money in the country and the amount in circulation represents the money in the treasury. The circulation per capita July 1, 1865, has been popularly stated to have been nearly $50, upon which assumption were evidently based the articles criticised by Mr. Burroughs. According to the official figures, the circulation July 1, 1865, was $20.57 per capita, while the same authority puts the circulation July 1, 1891, at 23.45 per capita, divided as follows:

JULY 1, 1865.

(Population, 34,748,000; circulation per capita, $20.57.)

	Gener'l stock coined or issued.	In Treasury	Amount in Circulation.
Fractional curren'y	$25,005,829	$3,277,074	$21,728,755
State bank notes...	142,919,638	.....	142,919,638
United States notes	431,066,428	52,149,686	378,916,742
National bank not's	146,137,860	.....	146,137,860
	745,129,755	55,426,760	689,702,995
Add: Specie in circulation on the Pacific Coast.....	.....	.....	25,000,000
			714,702,995

JULY 1, 1891.

(Population, 63,975,000; circulation per capita, $23.45.)

Gold coin.....	$584,524,184	$176,450,378	$408,073,806
Stand. sil. dolls.	405,659,268	347,976,227	57,683,041
Subsidiary sil..	77,947,617	19,656,695	58,290,924
Gold certific'tes	152,456,429	31,606,030	120,840,399
Silver certific's	314,715,185	7,351,037	307,364,148
Treas.notes, act July 14, 1890.	50,228,417	9,765,252	40,463,165
U. S. notes	346,681,016	1,601,744	345,079,272
Nat. bank notes	167,927,974	5,655,174	162,272,800
	2,100,130,092	600,062,537	1,500,067,555

Tendencies of Our Railways.

The railway mileage of the United States, as stated in the third annual report of the Interstate Commerce Commission, was 163,597 miles, on June 30, 1890, an increase of nearly 6,000 miles over that of the preceding year. Michigan showed the largest increase, or 459 miles, and Georgia next, with 437 miles.

The tendency of the great systems to absorb tributary lines appears in the fact that 8,101 miles of line disappeared as independent companies during the year in question. Fifty companies, representing a mileage of 6,196 miles, were consolidated with other companies, and thirty-four companies merged their corporate existence with others. Forty corporations operate 47.5 per cent. of the total mileage of the United States, or an average of nearly 2,000 miles each, and seventy-five corporations receive eighty per cent. of the total amount paid by the people of the nation for railway service. The number of corporations whose mileage is leased to others for operation is nearly one-half; in other words, there are 927 operating companies, and 735 subsidiary companies.

Practically all the passenger locomotives are fitted with train brakes (those which place the control of the whole train in the engineer's hands), and almost all the passenger cars are thus equipped. The more difficult task of thus equiping the freight cars proceeds very slowly, considering the fact that 265 train men were killed during the year while coupling or uncoupling cars, and 6,073 injured, the 75,485 freight cars fitted with automatic couplers is but a trifling proportion of the whole number of freight cars, which is 913,580. This subject has received attention from President Harrison in his annual messages, and legislation for the remedy of this evil is sought from the present Congress.

The number of men employed on the railways of the United States is 749,301, an increase of 44,558 during the year.

The capitalization of railway property is largely in excess of its market value. The average is $60,340 per mile, while the net earnings of all the corporations, capitalized at five per cent., shows a value of $42,374 per mile. The increase in railway capital for the year ending June 30, 1890, over that of the previous year, was $558,079,233, of which at least $250,000,000 was due to the increase in capitalization on lines already in existence. The proportion of capital represented by stocks was 46.73 per cent. of the total. The amount of stock per mile of line was $28,193, and the amount of outstanding obligations, including bonds, equipment, trust obligations, etc., was $29,250. There are marked differences in the capitalization of railway property in various sections of the country. In the Middle States, for example, railway capital is outstanding to the amount of $117,902 per mile of line. In California, Oregon, Washington, Idaho, Nevada, Utah and Arizona railway capital is outstanding

(*Continued to Page* 142.)

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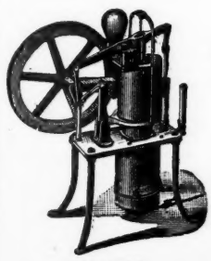

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THE AGRICULTURAL REVIEW.

(*Continued from Page* 140.)

to the amount of $87,104. The roads which converge in Chicago, lying east of the Missouri river, are capitalized at $47,645 per mile of line, which fairly represents the capitalization in the other sections of the country, exclusive of the Middle States and the Pacific Slope.

The number of passengers carried during the year was 492,430,865, and the aggregate number of miles traveled by all passengers was 11,847,785,617. This shows an average journey of 24.06 miles per passenger. Passenger train mileage for the same period was 285,575,804, showing the average number of passengers carried in a train to be forty-one. The number of tons of freight carried was 636,541,617; the number of tons carried one mile was 76,207,047,298. This shows the average haul per ton to have been 119.72 miles. Freight train mileage was 435,170,812, showing the average number of tons per train to have been 175.12. The density of passenger traffic was greatest in the New England States, and that of the freight was greatest in the Middle States.

The revenue per passenger per mile of line was $.026; the average cost of carrying one passenger one mile was $.019. The revenue for carrying a ton of freight one mile was $.009: the cost of carrying a ton of frieght one mile was $.006. The revenue from a passenger train run one mile on all the railways in the United States was $1.08; the cost of running a passenger train one mile was $.809. The revenue from a freight train running one mile was $1.65; the average cost of running a freight train one mile was $1.05. These figures show the margin from which railways must secure their profits in the business of transporting passengers and freight. The revenue per ton per mile and per passenger per mile differ greatly in the various sections of the country. The lowest receipts per ton per mile are in the States of Indiana, Michigan and Ohio, being $.0069. The highest rate of revenue is found on the Pacific slope, it being $.0165. The lowest receipts for carrying a passenger one mile are found in the New England States, being $.019. The highest receipts for carrying a passenger one mile are found in Louisiana, Texas and New Mexico, being $.0258. These figures represent the average of charges, and not the rates on any particular commodity or for any particular trip.

Of the 6,334 persons killed on the railways, 2,451 were employees and 286 passengers, many of the remaining 3,597 being suicides. Of the 29,025 persons injured, 22,394 were employees, and 2,425 passengers, besides 4,206 unclassified. Railway travel is found to be least safe in the States south of the Potomac and Ohio rivers, where one passenger is killed for each 838,555 passengers carried. In the States lying east of Illinois and north of the Ohio and Potomac rivers, one passenger is killed for each 2,519,851 carried. In the former district one train man is killed for each sixty-five employed, an appalling proportion, and in the latter one train man for each 107 employed. Railway travel and employment are somewhat safer in the West than in the South.

In closing its report the Interstate Commerce Commission recommends that the law be amended so as to make express companies, which pay to railways a rental of $20,277,711 a year, amenable to control, so that corporations engaged in the transportation of passengers and freight by water, on the Great Lakes and the Atlantic Seaboard, be required to report to the Commission; so that reports may be called for from all companies furnishing rolling stock to railway corporations, and from all companies providing terminal facilities.

Dangers of the Single Tax.

The assertion is made in the *Political Science Quarterly*, by C. B. Spahr, that the application of Henry George's single-tax principle in new communities of the United States would leave the public absolutely penniless. According to the single-tax formula, the public should take only the rental of that part of the value of the land which is not due to improvements; in other words, that part of the value which should pay the tax is the part arising "from the presence of all." In Montana the census of 1880 showed real estate valued at $5,000,000 and personal property valued at $13,500,000. The direct taxes were $383,000. Upon the total property of the State this tax amounted to over two per cent. If only real estate had been taxed, it would have been necessary to make a levy of seven per cent., and if only land had been taxed, a levy of fourteen per cent., probably, would have been necessary. Deducting from the value of the land that which is owing to clearing, draining, road-making, fertilizing and other improvements, the tax would certainly have been thirty per cent., and probably 100 per cent. The rentals which the single-tax proposes would pay but the smallest fraction of the present outlay for local public purposes. In crowded England, the single-tax would produce a deficit of $200,000,000 annually in the budget. A progressive tax averaging two per cent. upon all incomes from property, and a like tax upon all inheritances, would render possible the abolition of the taxes upon comforts and necessities.

The Food Supply of the Future.

Prof. W. O. Atwater opens a discussion of this topic in the November *Century* with the inspiring declaration that chemistry and physiology, in defining the laws of plant growth, imply that the capacity of the earth for yielding food for man is almost unlimited. Scientific research and practical experience make this more and more certain. The present food supply, moreover, can be better economized, and it can be increased by fish culture, by better tillage of the soil, and by irrigation. Comparisons made by the writer, who has collated the dietaries of several hundred persons of all social grades, both in the United States and in Germany, England, Italy and France, show the quantities consumed on the American side to be very much the larger. Taking fuel values as the measure of the power of the food eaten to yield heat to keep the body warm and give strength to do its work, these being expressed in heat units or calories, a European laboring man requires on an average 3,050 to 3,150, and an American laborer 3,500 calories. Professional men in Germany are well nourished with food, supplying 2,500 to 2,800 calories per day, while men in similar callings in New England require 3,400 to 4,500 and more.

Germans eat only one-third as much sugar and starch as Americans. We should eat less fat. Our farmers need to produce leaner meat, thereby saving the grass and corn that now goes to produce fat. Then by cultivating fish and eating it more liberally, we shall need to raise correspondingly fewer animals to produce protein, saving large areas for the culture of wheat and other vegetables. In this way the soil can be made far more nourishing for man than is otherwise possible. Moreover, the fact that science can make it possible for farmers to artificially fertilize barren or exhausted soils shows that little is to be feared from the supposed exhaustion of soils. The visible supply of phosphoric acid for fertilizing purposes is sufficient for the agriculture for untold thousands of years. While the present potash mines in Germany may possibly fail, others will probably be discovered.

That nitrogen is drawn from the atmosphere in far larger quantities than is usually supposed and by leguminous plants in particular, is confirmed by the experiments of Wolff, Lawes, Gilbert, and Boussingault. The agency of microbes in the soil in supplying plants with nitrogen, through the roots, is indicated strongly by the experiments of Prof. Berthelot, of Paris; Prof. Hellriegel, of Germany, and Prof. Atwater himself. The interesting fact that the ferment which transforms the effete matters of earth into plant food is brought about by bacteria, was discovered by Herr Winogradsky, of Zurich, Switzerland. The process is called nitrification, and the group of bacteria were named nitromonas. The microbes, of which we are wont to think as agents of disease and death, are constantly providing for our welfare by a process which scientists are studying with the utmost eagerness. The millions of dollars expended by farmers every year in renewing exhausted soil with nitrogen, by means of fertilizers, will be saved when the farmer learns to obtain his nitrogen from the air without money and without price. Leguminous plants solve this problem.

Prof. Atwater dilates upon the wonderful increase of food production by irrigation. The artificial production of foods is possible, glucose having already been changed into sugar, and peptone (into which the albuminoids of our food are transformed in the process of digestion) has been manufactured.

Minor Matters.

The Farmer is Prosperous.—The depression in prices which last year brought the farmer to an attitude of protest against the injustices he suffers, is mainly over, and generally he is prosperous. He still fails to secure his full share of the rewards of his productive labor, owing, according to locality, to unequal taxation, discriminations of railroad transportation, the greed of huge monopolies, inadequate provisions for watering the arid lands, the unhealthful extension of railroads, the exactions of the middlemen, robbery carried on by speculators, and other causes. It is a matter for congratulation that boys leave the farm for other pursuits, because the interests of farmers in this country require that not more than forty per cent. of the national body of workers shall be engaged in rural occupations, or overproduction would result. The personal testimony of progressive farmers in the West, the South and the East acknowledges no depression. So writes J. R. Dodge, Statistician of the United States Department of Agriculture, in the *Century* for January.

The Rochdale System. — W. Berginnis writes from Galveston, Texas: "I have read a great deal about coöperation in the AMERICAN AGRICULTURIST, and have been desirous to hear something about the system employed in Rochdale, England." This whole subject is fully considered in our book "How to Coöperate," price $1.50 postpaid. The book is based on the Rochdale system, but describes, most fully, the methods by which that system has been applied to the special needs of producers and consumers in the United States. Chapter 2 gives a history of the Rochdale system and its success in England. The Appendix of the book, in addition to containing the by-laws and rules of many successful coöperative associations in the United States, also contains a complete reprint of the model rules and working by-laws of the original Rochdale Equitable Pioneers' society, this being the only publication of these rules in the country. As to the success of the Rochdale system in England, the reports at the Coöperative Congress, held in May, 1891, showed that, in 1890, there were in England, Scotland, Ireland, and Wales, 1,554 coöperative societies with 1,117,055 members, having a share capital of $61,309,760, making total sales for the year of $216,001,595, and earning net profits of $20,850,190, besides having invested in real estate and other permanent property $31,484,820. There has been a steady increase in the business for years. The average dividend or rebate (savings) to purchasers was nearly eleven per cent, besides which five per cent. interest was paid on capital, liberal grants made to education and charity, and great sums passed to reserve or charged off for depreciation. That is to say, the coöperative retail societies return to their patrons about eleven cents for every one hundred cents expended in purchases at these stores, besides building up the business in a substantial manner.

Danger of a Water Monopoly.—The movement for a cession of the arid lands of the West to the States in which they lie concerns other States as well, namely those whose water-courses rise in the former. The streams which irrigate Nebraska, Kansas and New Mexico, and parts of South Dakota, Utah, Idaho and Arizona, have their rise in Wyoming and Colorado, the States for which is asked the control of the irrigation question. Should this control be given by Congress, and the State governments choose to store the water at their disposal, it is claimed that farming in Western Kansas, Western Nebraska, and throughout Nebraska, would be impossible. Bills providing for the cession of arid lands to the States, and petitions to the same effect, have been introduced in Congress.

Farmers in Legislatures. — Of the forty-four farmer members of the General Assembly of Ohio for 1892-3, there are twenty-nine republicans and fifteen democrats. The people's party did not elect a solitary candidate on the State or legislative ticket, nor to any other important office. The Alliance and Grange, however, took a hand in the nominations within their respective political party lines, with the splendid result shown above. These farmers will, as heretofore, form a Legislative Farmers' Club, and completely control such legislation as may affect their general interest—an example worthy of imitation in other States.

Mr. S. G. Derry
of Providence, R. I.

Widely known as the proprietor of Derry's Waterproof Harness Oil, tells below of his terrible sufferings from Eczema and his cure by

Hood's Sarsaparilla

"Gentlemen: Fifteen years ago I had an attack of inflammatory rheumatism, which was followed by eczema, or salt rheum, breaking out an my right leg. The humor spread all over my legs, back and arms,

A Foul Mass of Sores,

swollen and itching terribly, causing intense pain if the skin was broken by scratching, and discharging constantly. It is impossible to describe my suffering in those years of agony and torture. I spent

Thousands of Dollars

in futile efforts to get well, and was discouraged and ready to die. At this time I was unable to lie down in bed, had to sit up all the time, and was unable to walk without crutches. I had to hold my arms away from my body, and had to have my arms, back and legs bandaged by my faithful wife twice a day.

"Finally a friend who was visiting at our house, urged me to take Hood's Sarsaparilla. I began by taking half a teaspoonful. My

Stomach Was All Out Of Order

but the medicine soon corrected this, and in six weeks I could see a change in the condition of the humor which nearly covered my body. It was driven to the surface by the Sarsaparilla, the sores soon healed, and the scales fell off. I was soon able to give up bandages and crutches, and a happy man I was. I had been taking Hood's Sarsaparilla for seven months; and since that time, nearly two years, I have worn no bandages whatever, and my legs and arms are sound and well.

The Delight

of myself and wife at my recovery it is impossible to tell. To all my business friends in Boston and over the country, I recommend

Hood's Sarsaparilla

from personal experience." S. G. DERRY, 45 Bradford street, Providence, R. I.

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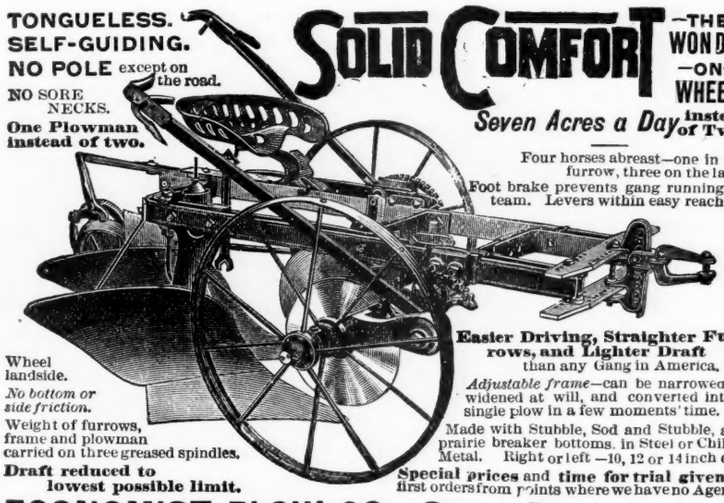

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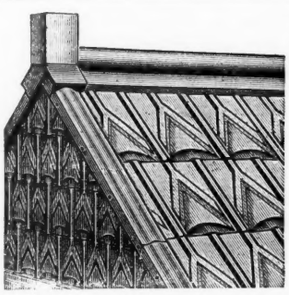

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MATTERS OF BUSINESS.

Legal Weights per Bushel.

IN THE UNITED STATES.

This table was compiled by the United States Department of Agriculture in March, 1891, except that the data for the United States standard, New York, and Rhode Island, and most of the facts in this note were supplied from official sources. No Legislature has changed any of these weights up to December 15, 1891. The great variations in the weights of some crops indicates the necessity of a uniform standard. Apples are 44 pounds per bushel in Maine, 50 in Connecticut, New Jersey, and Arkansas; 57 in Wisconsin, and not specified elsewhere. Hair is 11 pounds per bushel in Maine, but in all other States mentioned, Virginia, Georgia, Florida, Alabama, Tennessee, Kentucky, Illinois, Kansas, and Nebraska it is eight pounds. Bran is twenty pounds per bushel, but is not stated in the South and Northwest. Native bluegrass seed is 14 pounds in Virginia, Georgia, Mississippi, Arkansas, Tennessee, Michigan, Indiana, Illinois, Iowa, Missouri, Kansas. English bluegrass, 22 pounds in Nebraska, Colorado, and Montana, but is not specified in other States. In Delaware sifted corn meal is 44 pounds, and in that State other articles take the United States standard. In Arkansas and Mississippi 33⅓ pounds, not 33, is the legal unit for cotton seed. In New York coal, ashes, meal, manure, Indian corn in the ear, fruit, and roots of every kind, the standard is the half-bushel of 1075.21 cubic inches and its multiples and subdivisions. Hominy is 50 pounds in Massachusetts, 60 pounds in Ohio. Ground pease, 25 pounds in Georgia, 24 pounds in Kentucky. Parsnips, in Connecticut 45 pounds, Wisconsin 44, Montana 50. Rutabagas, 60 pounds in Maine and Connecticut, 56 pounds in Wisconsin. Mangelwurzels, the same, but 50 pounds in Washington. Vegetables, not specified, 50 pounds in Rhode Island and Washington. Onion top sets, 28 pounds in Virginia, Nebraska 25. Dried plums, 28 pounds in Michigan; peeled peaches, Virginia 40, Georgia, 38. Currants, gooseberries, and grapes 40 pounds in Iowa. Other berries, Rhode Island and Iowa 32 pounds, Michigan 40. Chestnuts, 57 pounds in Virginia, and in the same State peanuts, 22 pounds. Broom-corn seed, 30 pounds in Iowa and Dakotas. Cottonseed, Georgia 30 pounds, Missouri 33. Osage orange seed, 34 pounds in Virginia, Michigan 33, Iowa and Nebraska 32. Rape seed, 50 pounds in Wisconsin. Sorghum seed, 30 pounds in Iowa and Nebraska. Orchard-grass seed, 14 pounds in Virginia and Michigan; redtop, 12 pounds in Virginia, Michigan 14. The United States standard are the weights prescribed for articles mentioned by the tariff, including coal at 80 pounds per bushel.

Personal, Agricultural, Commercial.

The Future of Extensive Farming.—The United States Senator from North Dakota, Mr. Cosey, one of the largest farmers in the country, says: "The farms of the future, in this country, will be large ones, rather than small ones. Farming becomes more of a business every year, and the outlook is that, from now on, farming will be one of the best paying industries of the United States. The day of cheap lands is passing away. There is very little unoccupied government land left which is worth anything, and the day has come when the prices of cereals must rise and the people must pay the farmers what their products are worth. The increased consumption of wheat the world over averages 40,000,000 bushels every year, and this increase will go on. The time will come when there is less wheat than the world wants, and prices will have to rise to induce the farmers to raise it. I look for the time when wheat will be $1.50 a bushel, and even at this rate it will hardly pay to raise it in some parts of the Union."

Another Reciprocity Treaty has been signed between the United States and the republic of Salvador, and the following are some of the articles to be admitted into that country, after February 1st, free of all customs duties and taxes: Animals for breeding, corn, rice, barley, rye, beans, hops, hay, straw, fresh fruit, fertilizers, agricultural implements, machinery, material for railroads, electricity and gas, wood, wagons, carts, etc., barbed wire and staples, and samples of merchandise not exceeding one dollar in value. Our exports to Salvador in 1890 were $886,231, while we imported $1,384,112 of free and $69,846 of dutiable goods. Under the treaty these figures will change materially.

The Apple Scare in England.—The horticultural journals in London and many of the English newspapers are renewing their attack on American apples on the ground that they contain arsenic. The *Horticultural Times* is the author of the arsenic scare. The rapid increase in the popularity of American apples in the English market, our exports from August 1 to December 31, 1891, having been over 1,000,000 barrels, is the true cause of this attack on their healthfulness. The AMERICAN AGRICULTURIST calls the attention of the United States Department of Agriculture to this libel on one of our prominent money crops. Secretary Rusk should at once formally notify the English "powers that be" that there is nothing whatever in the arsenic scare. The infinitesimal amount of arsenic used in spraying apple trees to protect them against the codlin moth could, under no circumstances, injure the consumer of the fruit. The spray is applied early in the season, seldom after the fruit is larger than a robin's egg, and so diluted that bushels of apples even at that time would not contain poison enough to hurt a fly. Four months later, when the crop is harvested, repeated rains have washed off whatever atoms of arsenic may have remained on the green fruit. Our English exchanges are requested to copy this statement and thus do us tardy justice.

What a Great Journal Says.—The AMERICAN AGRICULTURIST having rounded out half a century of useful and progressive existence, celebrates the occasion by the publication of an enlarged holiday number of unusual excellence, with a strong list of contributors and illustrations of high artistic merit. Agricultural science has made marvelous progress during the period of its publication, and no more striking evidence of the advance can be furnished than the contrast between the first modest issue of this farming journal and the current number crammed with practical information from countries near and far. Under the able editorial management of Dr. F. M. Hexamer, this monthly magazine has reached a high level of efficiency, and is well equipped for conducting the scientific education of farmers in every quarter of the English-speaking world.—*New York Tribune*, Jan. 4.

The Gem Steel Wind Engine and Gem Steel Tower.—The Gem steel wind engine is the latest product of the U. S. Wind Engine & Pump Co., of Batavia, Ill., a firm that has made the manufacture of windmills a specialty during the last thirty-seven years. This engine embodies beauty, simplicity, strength, power and durability to the highest degree. For a more complete description and presentation of its many points of excellence, we would refer our readers to the manufacturers at Batavia, Ill,, or their branch offices at Omaha, Neb., and Kansas City, Mo. George Tyler & Co., Boston, Mass., General Agency for New England. The U. S. Wind Engine & Pump Co. manufactures also the celebrated Halladay Standard pumping and geared mills, the U. S. solid wheel and standard vaneless mills, which are used for pumping and power purposes, and which enjoy the most enviable reputation, both at home and in every foreign country. They are well and favorably known as extensive contractors of railroad water stations and water works for cities and villages.

Bicycles.—Messrs Schoverling, Daly & Gales, 302 Broadway, New York, are preparing for a large Bicycle trade during the approaching season. This enterprising firm handles the celebrated Gales Safety for the United States and also controls the Humber line of wheels for the following States, viz: New York, New Jersey, Pennsylvania, Delaware, Maryland and Ohio. The '92 Gales has been greatly improved, and is one of the best $100 wheels on the market. The Humbers are world-renowned for strength, lightness, easy running and workmanship, and dealers should apply for agency at an early date. Three-quarters of the races of last year were won on Humber wheels. We understand their line of improved boys' and girls' wheels will contain some taking novelties.

Additional Markets for Farmers.—The reciprocity treaty concluded between the United States and the British West Indies is expected to go into operation on February 1st, and will, without doubt, result in a large increase in the exports of American products in that direction. For the fiscal year ending June 30, 1891, our imports from the British West Indies amounted, in value, to $16,293,184, being almost two per cent. of the total imports of this country. American exports to these islands, during the same period, were valued only at $9,546,058, being but little more than one per cent. of the total exports of this country.

Among the many changes to be made, that most directly affect the farming interests, are the following: Wheat flour will be admitted into all the British West India Colonies, except Trinidad, at one-half the rate of present duties. Pickled beef and pork are allowed a reduction of twenty-five per cent. from present duties. Bread, biscuit, bacon, hams, cheese, and lard, are reduced fifty per cent. In Jamaica, the duty on butter is reduced from four to two cents per pound. Mules, shooks, and staves are reduced fifty per cent., except at Jamaica, where they are free.

Among other articles to be admitted free of all duties are: Sheep, hogs, poultry, horses for breed-

[*Continued on Page* 146.]

STATES.	Apples, Dried.	Barley.	Beans, Castor.	Beans, White.	Buckwh't	Corn, ear.	Corn, Shelled.	Corn Meal.	Malt Barley.	Onions.	Oats.	Potato, Irish.	Potato, Sweet.	Pease.	Rye.	Clover Seed.	Cotton Seed.	Flaxseed.	Hemp Seed.	Hungarian Grass Seed	Millet Seed.	Timothy Seed.	Turnip.	Wheat.
Maine	....	48	....	62	48	..	56	50	....	52	32	60	....	60	..	....	....	..	....	....	....	45	60	60
New Hampshire	....	..	62	62	..	..	56	50	....	..	32	60	....	60	56	....	....	..	....	....	....	....	..	60
Vermont	....	48	....	62	48	..	56	..	....	52	32	60	....	60	56	60	....	..	....	....	....	45	..	..
Massachusetts	....	48	....	....	48	..	56	50	....	52	32	60	....	..	56	....	....	..	....	....	....	45	..	60
Rhode Island	....	..	....	....	..	..	..	..	....	..	..	..	....	..	..	....	....	..	....	....	....	....	..	..
Connecticut	....	48	....	60	48	..	56	50	....	50	32	60	....	60	56	....	....	..	....	....	....	....	50	60
New York	....	48	....	62	48	..	58	..	....	..	32	60	....	60	56	60	....	55	....	....	....	44	..	60
New Jersey	25	48	60	....	50	..	56	..	....	57	30	60	54	60	56	64	....	55	....	....	....	45	..	60
Pennsylvania	....	47	....	....	48	..	56	..	....	..	30	60	....	..	56	62	....	..	....	....	....	....	..	60
Delaware	....	..	....	....	..	..	56	48	....	..	..	..	....	..	..	....	....	..	....	....	....	....	..	60
Maryland	....	..	....	....	..	..	..	..	....	..	26	56	56	..	..	....	....	..	....	....	....	....	..	..
Virginia	28	48	....	60	52	70	56	50	38	57	32	60	56	60	56	60	....	56	44	48	50	45	55	60
North Carolina	....	48	....	....	50	54	....	46	....	..	30	..	....	50	..	64	30	55	....	....	....	....	..	60
South Carolina	28	48	60	60	56	72	56	50	....	57	32	60	60	60	56	60	32	..	....	....	....	....	..	60
Georgia	24	47	....	60	52	70	56	48	....	57	32	60	55	60	56	60	30	56	44	....	....	45	55	60
Florida	26	48	46	60	48	70	56	48	38	57	32	60	55	60	56	60	40	56	44	50	50	45	55	60
Alabama	26	48	46	60	48	70	56	48	....	57	32	60	55	60	56	60	32	56	44	50	50	45	55	60
Mississippi	....	48	60	60	..	70	56	48	....	..	32	60	50	60	56	60	33	56	44	48	50	45	..	60
Louisiana	....	..	....	....	..	70	56	50	....	..	32	....	....	..	..	....	30	..	....	....	....	....	..	..
Texas	28	48	....	60	42	70	56	..	....	57	32	60	55	..	56	60	32	56	44	48	50	45	55	60
Arkansas	24	48	....	60	52	70	56	48	....	57	32	60	50	60	60	60	33	56	....	....	50	60	57	60
Tennessee	24	48	46	60	50	70	56	50	....	56	32	60	50	60	56	60	28	56	44	48	50	45	50	60
West Virginia	25	48	60	60	52	..	56	..	....	..	32	60	60	..	56	60	....	56	....	....	....	45	..	60
Kentucky	24	47	45	60	56	70	56	50	....	57	32	60	55	60	56	60	....	56	44	50	50	45	60	60
Ohio	22	48	60	60	50	68	56	..	34	50	32	60	50	60	56	60	....	56	44	50	50	45	..	60
Michigan	22	48	46	60	48	70	56	50	....	54	32	60	56	60	56	60	....	56	44	50	50	45	58	60
Indiana	25	48	46	60	50	68	56	50	35	48	32	60	55	..	56	60	....	..	44	....	50	45	..	60
Illinois	24	48	46	60	52	70	56	48	38	57	32	60	55	..	56	60	....	56	44	....	....	45	55	60
Wisconsin	28	48	....	60	50	70	56	48	34	57	32	60	55	..	56	60	....	56	44	48	50	45	42	60
Minnesota	28	48	....	....	42	..	..	..	....	..	32	60	....	..	56	60	....	..	....	....	....	....	..	60
Iowa	48	48	46	60	52	70	56	..	....	57	32	60	46	..	56	60	....	56	44	48	48	45	..	60
Missouri	24	48	46	60	32	70	56	50	38	57	32	60	56	60	56	60	33	56	44	48	50	45	42	60
Kansas	24	48	46	60	50	70	56	50	32	57	32	60	50	..	56	60	....	56	44	50	50	45	55	60
Nebraska	24	48	46	60	52	70	56	50	30	57	32	60	50	60	56	60	....	56	44	50	50	45	55	60
Calfornia	....	50	....	....	40	..	52	..	....	..	32	....	....	..	54	....	....	..	....	....	....	....	..	60
Oregon	28	46	....	....	42	..	56	..	....	..	36	60	....	..	56	60	....	..	....	....	....	....	..	60
Colorado	....	48	....	60	52	70	56	50	....	57	32	60	....	..	56	60	....	..	44	....	....	45	..	60
North Dakota	....	48	....	60	42	70	56	..	48	52	32	60	46	60	56	60	....	56	....	....	....	42	60	60
South Dakota	....	48	....	60	42	70	56	..	....	52	32	60	46	60	56	60	....	56	....	....	....	42	60	60
Idaho	....	50	....	....	40	..	52	..	....	..	32	....	....	..	54	....	....	56	....	....	....	....	..	60
Montana	....	48	....	60	52	..	56	50	....	57	35	60	....	..	56	60	....	..	44	....	....	45	50	60
United States standard.	....	48	50	....	42	..	56	48	34	..	32	60	....	60	56	....	....	56	....	....	....	....	..	60

HAVE YOU A GARDEN?

IF so, you will need not only Seeds, but also will likely be in want of Small Fruits, Flowering Plants, etc. **Poor Seeds are an abomination,** and if you have ever had any experience with them, once has been enough. It is our business to supply the best of everything in plant life, and to give the readers of the AMERICAN AGRICULTURIST some idea of our success, would say our '92 book represents an expenditure exceeding **$41,000** for the first edition alone. From Oct. 1, 1890, to Oct. 1, 1891, we paid the Philadelphia Post Office **$20,860.58** for postage. We mention these items simply to give you an idea of what we are doing in our special line. The credit of this business success belongs exclusively **to the superior excellence of Maule's Seeds and Plants.**

This year's Seed Book, the first edition of which consists of 200,000 copies, contains 732 illustrations, **58 of which are in colors,** weighs over 12 ounces, and is brim full and running over with all the good things in plant life. It is too expensive to mail free, but we will be pleased to send a copy to every reader of this advertisement sending us five two-cent stamps. Representing, as it does, the **largest mail trade in America,** it should be in the hands of every gardener or small fruit grower before purchasing their supplies for '92. Address

WM. HENRY MAULE,
1711 Filbert St., Philadelphia, Pa.

☞ **Mention this paper and receive, free of charge, a pkt. of Earliest of All Tomatoes (now first offered, worth 20c. any other way); it is 3 to 5 days earlier than any other, of good shape, size, and color; or a packet of Marguerite Carnation, which blooms 4 months from sowing the seed.**

THE FREEMAN

Absolutely the Greatest Potato Since the Introduction of the EARLY ROSE.

Have you read what T. B. Terry has to say about the Freeman? **305 bushels** from one barrel.
J. M. Smith, the celebrated market gardener of Wisconsin, also makes an astonishing report.

Prices for 1892—lb., $1.00; 3 lbs., $2.00, by mail, postpaid. By Express or Freight, purchaser paying charges, peck, $2.50; bushel, $7.50; barrel, $15.00; two barrels, $25.00; ten barrels, $100.00.

☞ *Our new Catalogue for 1892 mailed free to all on receipt of 5 two-cent stamps; contains full description, testimonials, etc.*

WE ABSOLUTELY CONTROL THE ENTIRE SUPPLY OF FREEMAN IN THE UNITED STATES. THE GENUINE CAN BE OBTAINED NOWHERE ELSE, AND ALL ORDERS SHOULD BE ADDRESSED TO

WM. HENRY MAULE, 1711 Filbert St., Philadelphia, Pa.

MATTERS OF BUSINESS.

(*Continued from Page* 144.)

ing, bran, middlings and shorts, cotton-seed, and its products, eggs, fertilizers, fish and fishing apparatus, fruit and vegetables, fresh or dried, when not canned, tinned, or bottled, hay and straw, utensils and tools for agriculture, starch of Indian corn or maize, tan-bark, trees, plants, vines, and seeds of all kinds, for propagation or cultivation.

The Crops of 1891.—The final estimates of the United States Department of Agriculture, announced January 6th, differ in some details from the AMERICAN AGRICULTURIST'S estimates, compiled in November and printed in our anniversary number for January. The estimates in this magazine for September for corn prove to be almost exact, except that the value is lower than we predicted. This is due to the unexpected out-turn of wheat and its low price per bushel, caused by indiscriminate marketing, lack of transportation facilities and speculation. The world's situation certainly makes intrinsic values $1.00 per bushel for wheat and fifty cents for corn, and that prices are ten per cent. under these values is due to artificial rather than natural causes. The details of the two estimates for the whole United States are as follows, all in round millions:

THE CORN CROP.

		Acres.	*Bushels.*	*Value.*
AMERICAN AGRICULTURIST	Aug. 10		2,000	$1,000
" " "	Nov. 25	77.9	2,104	840
Department Agriculture	Jan. 6	76.2	2,060	836

THE WHEAT CROP.

AMERICAN AGRICULTURIST	Aug. 10		500	500
" " "	Nov. 25	39.1	586	493
Department Agriculture	Jan. 6	39.9	612	513

THE OAT CROP.

AMERICAN AGRICULTURIST	Aug. 10		622	250
" " "	Nov. 25	25.6	750	242
Department Agriculture	Jan. 6	25.6	738	232

The Mapes Tobacco Manure, wrapper brand, advertised in this magazine by the Mapes Formula & Peruvian Guano Co., of 158 Front street, New York, has won the proud distinction of having raised the crop which sold at the highest price received in the Connecticut valley last year—thirty-two cents per pound for the entire yield. This crop was grown in South Deerfield, Mass., and eighty-four per cent. of it was suitable for wrapping cigars, which accounts for the high price. In many other cases the Mapes manure has been used with similarly good effect on tobacco. This crop is a most delicate feeder, and growers who wish to secure the best prices should by all means read the Mapes advertisements and study Prof. Mapes's illustrated catalogues and pamphlets describing his system of feeding the tobacco crop.

Canadian Egg Exports. — Canadians have sought a market for their eggs in England, since the United States levied an import duty of five cents per dozen on them. The result has not been satisfactory. Cases were broken, waste was enormous, and though the eggs looked bright and fresh, they were reported musty by consumers. A shipment of 3,600 dozen cost, at eleven cents per dozen, $396; boxing, insurance, collecting eggs and other expenses came to $35.25, making total expenses $431.25. The shipper received cash, less exchange, $432, making his net profit seventy-five cents on the shipment.

To Reduce the Acreage of Cotton.—Confronted by a large over-production of cotton, the farmers of the Gulf and Atlantic States of the South are seeking to diversify their crops. The Charleston, South Carolina, *News and Courier* reminds the farmers of the thousands of chickens and turkeys daily received in that city from the West, of the heavy consignments of eggs from the West, of the large quantities of Michigan celery which should be replaced with the fine product of South Carolina's bottom lands, and of the jellies and preserves which come from a distance, all of which could be produced at home at a profit, thus reducing the acreage of cotton and stimulating the agricultural industry. The over-production problem was discussed with great earnestness by

(*Continued on Page* 150.)

20,000 POUNDS OF BUTTER DAILY

Is the capacity of the Franklin County Creamery at St. Albans, Vt., the largest creamery in the world.

After trying all the butter colors on the market, Mr. T. M. Deal, the manager, adopted Wells, Richardson & Co's Improved Butter Color, for the following reasons:

1. It gives the most natural color, not even turning reddish when too much is used.

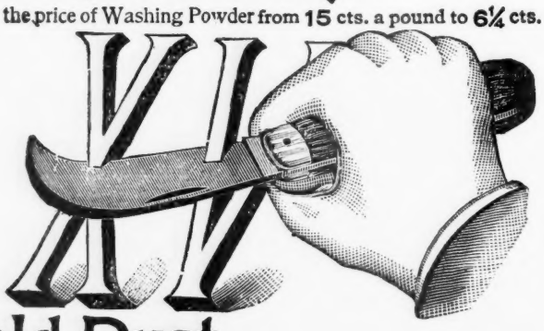
2. It is superior in strength and brilliancy, being full twice as strong as some other colors tested. This makes it the most economical.

3. It is free from taste and odor, does not hurt the keeping qualities of butter, and will not fade.

A butter-maker who tries this color once, will never use any other color, as a test is sufficient to show its superiority.

We Cut Down

the price of Washing Powder from 15 cts. a pound to 6¼ cts. a pound.



Gold Dust Washing Powder

Has Done It. The daily cleaning and weekly washing can be BETTER done by Gold Dust Washing Powder than with ANY Soap or other Washing Powder, and at less than One Half the Cost.

Your grocer will sell you a package—4 pounds—for 25 cents.

N. K. FAIRBANK & CO., Sole Manufacturers

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POULTRY For PROFIT

FARM-POULTRY a practical poultry magazine; best poultry paper published; sent on trial, six mo's, 25c., or one year 40c., if you mention this paper. Sample free. I. S. Johnson & Co., 22 Custom House St., Boston, Mass.

NOTHING ON EARTH WILL MAKE HENS LAY LIKE SHERIDAN'S CONDITION POWDER

Highly concentrated. Dose small. In quantity costs less than a tenth cent a day. Prevents and cures all diseases. Good for young chicks and moulting hens. Sample for 35 cts. in stamps, five packs $1. Large 21-4 lb. can, by mail, $1.20. Six large cans, $5, express prepaid. Farm-Poultry one year (price 50c), and large can $1.50, I. S. JOHNSON & CO., 22 Custom House St., Boston, Mass.

UNLIKE ANY OTHER

JOHNSON'S ANODYNE LINIMENT

For Internal and External Use.

Stops Pain, Cramps, Inflammation in body or limb, like magic. Cures Croup, Asthma, Colds, Catarrh, Lame back, Stiff Joints and Strains. Full particulars free. Price, post-paid, 35 cts. I. S. JOHNSON & CO., Boston, Mass.

CIDER MACHINERY

Knuckle Joint & Screw Presses, Graters, Elevators, Pumps, etc. Send for Catalogue

Boomer & Boschert Press Co 216 W. Water St. Syracuse, N.Y

(PATENT ALLOWED.)

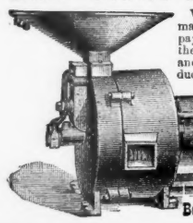
Pat. July 28, 1891.

RUPTURE CURED.

Worn Night and Day.

Perfect Comfort. Holds the worst rupture with ease. Has a new Pad which can be made larger or smaller by the patient. Sent by mail everywhere. Illustrated catalogue and rules for self-measurement sent securely sealed. G. V. House Mfg. Co., 744 Broadway, N. Y. City.

Burr-Stone Grinding Mills



We offer you the best mill on the market at such a low figure it will pay you to write to us. They are the best constructed, least complicated and fastest grinding mills yet produced. SATISFACTION GUARANTEED.

Send 2ct. stamp for our 48 page Illustrated Catalogue.

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THE PERKINS' Wind Mill

is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. All Wind Mills warranted. For Circulars and Prices address

The Perkins' Wind Mill & Ax Co. Agents wanted. Mishawaka, Ind.

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Beats Cleaning a Muddy Tail.

All Polished Metal.

Samples 25c. DES MOINES NOVELTY CO., 122 W. 4th Street, Des Moines, Iowa.

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The most vicious horse can be DRIVEN and CONTROLLED WITH EASE. Works the same as the J. I. C., but don't pull up so easy.

LEADS THEM ALL

Sample mailed X C for Nickel $1.50. $1.00

Stallion Bits 50 cents *extra.*

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The Most Remarkable of New Vegetables,

BURPEE'S BUSH LIMA.

The ONLY Bush Form of the TRUE Large Lima Bean.

BURPEE'S BUSH LIMA is the most unique novelty of the age, being the **first and only true bush form** of the popular Large Lima Bean. The bushes grow 18 to 22 inches high, stout, always erect, yet *branching so vigorously* that each plant develops into a magnificent circular bush, *two to three feet in diameter.* An *immense yielder*, each bush bearing from 50 to 200 of the handsome, large pods, well filled with the large beans, identical in size and **luscious flavor** to the well-known Large Pole Limas. By the introduction of this **most valuable novelty** the largest and best Lima Beans can now be cheaply raised in quantity without the expense and labor attached to the use of poles. Price per liberal packet, **20** cents; **3** packets for **50** cents; **7** packets for **$1.00**; postpaid.

OVER ONE THOUSAND DOLLARS IN CASH given as **PRIZES** for the best bushes raised this year. A separate prize for every State. For full information, read **Burpee's Farm Annual for 1892,** **The Best and Most Complete Seed Catalogue** of the year. A handsome book of 172 pages; tells all about the **Best** Garden, Farm and Flower **SEEDS,** including **Rare Novelties** of surpassing merit, which cannot be had elsewhere. Hundreds of truthful illustrations, and beautiful colored plates painted from nature. Price ten cents per copy, but **Free** *to all who intend to purchase Seeds.*

Please mention this paper. **W. ATLEE BURPEE & CO., Philadelphia, Pa.**

SEEDS ROSES PLANTS TREES

THEY GROW--THEY BLOOM.

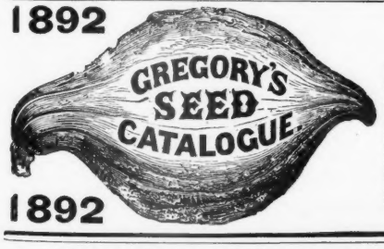
Catalogue Free 150 pages describing one of the most complete stocks in the U. S.

38 YEARS. 700 ACRES. 25 GREENHOUSES.

The STORRS & HARRISON CO.

PAINESVILLE, Lake Co., OHIO.

1892



1892

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We have always had very pleasant dealings together, the public and myself, and I again have the pleasure of presenting to them my Annual Vegetable and Flower Seed Catalogue. It contains the usual immense variety of seed, with such new kinds added as have proved to be real acquisitions. Raising many of these varieties myself, on my four seed farms, and testing others, I am able to warrant their freshness and purity, under such reasonable conditions as are contained in my Catalogue. Having been their original introducer, I am headquarters for choice Cory Corn, Miller Melon, Eclipse Beet, Hubbard Squash, Deep Head. All Seasons and Warren Cabbage, Etc., Etc. Catalogue **FREE** to all.

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Are grown from Jerrard's Famous Seed Stock in the virgin lands of the cold North-East. They comprise all the valuable New and Standard Kinds, and are warranted superior to all others for seed. They give Earliest and Largest Crops in every soil and climate.

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Are safe for Northern Latitudes, and for Very Early Vegetables or Large Standard Crops everywhere they are not surpassed.

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NEW CATALOGUE OF

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FLOWER SEEDS,

Besides all the desirable novelties of last season, and nearly everything else in my line of business.

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GARDEN, FLOWER AND FARM

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100 Bushels Per Acre.

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A NOVELTY OF STERLING MERIT. TRIED AND PROVED.
Praised by all who have tasted it. Flavor very rich.

Ears medium size, 12 rows, average over 500 kernels!

Price, 15 cents per packet. Try it. Sure to please

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Price of Floral Guide can be deducted on first order, or sent free with an order for any of our novelties. These occasionally give out, SO ORDER EARLY.

Twenty-two 1892 Novelties.

"Brilliant" Poppy,	15c.
6 Rare Chrysanthemums, Each 50c.; Set	$2.50
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Tulip-flowered Poppy,	25c.
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XXX Potato "American Wonder," 1 lb.	30c.
New 40-lb. Oat. Given for trial.	

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THE OFFER. To record every friend of Horticulture for our World's Fair Edition of '93, we will mail 5 GRAND SPECIALTIES.

Sweet Pea Blanche Ferry, large pink and white, 10 days earlier than any other; profuse bloomer on long stems; very sweet **Pansy Velvet Gem,** nearer red than any other Pansy, many reddish shades in its variations. **Nasturtium Aurora,** yellow with carmine and purple, a distinct novelty. **Mignonette,** Giant Gabriele, very handsome flowers with thick heavy spikes. **Carnation Margaret,** the greatest novelty, flowering in 12 to 15 weeks from seed, full double flowers in all the shades of this favorite flower.

These five and our 1892 Book "Gardening Illustrated", with cover illustration of flower girl in ten colors and gold, FOR ONLY 25c., less than half price. We make this offer only to secure your address as above. Come with us now. Seed Catalogue alone, free. MENTION THIS PAPER.

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☞ 10 samples Farm Seeds for 8c postage!

FOR **12 cts.** to introduce my Northern Grown Seeds everywhere, I offer postpaid:—

1 Pkg. Melon,
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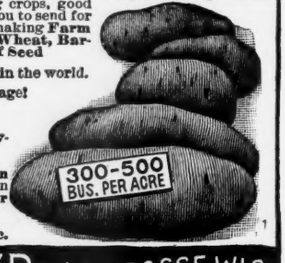
5 Pkgs. Elegant Flower Seed,

9 Pkgs. listed in no Catalog in America under 50c.

Elegant Seed Catalog 5c, with 9 pkgs 17c.



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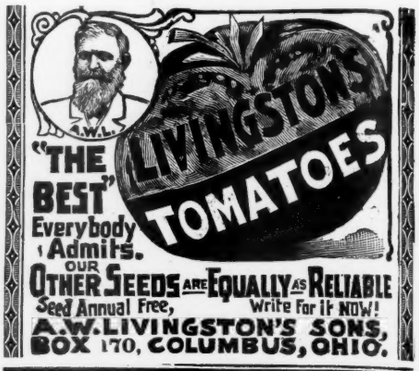

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NEW FRUITS A SPECIALTY.

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600 ACRES. 13 GREENHOUSES.

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No Trees LAST & BEAR like WHOLE ROOT Trees; see "Fruits and Fruit Trees"—Free. *Amer. Garden* says: Novel, USEFUL, to the point. *Orange Judd Farmer:* Ably written; gives trusty INFORMATION *Cal. Fruit Grower:* Surprising LOW prices! Apple, Pear, Cherry, Plum, PRUNE, Peach, Ap't, Quince, Nut, Or. Trees, Grafts, ROSES—*everything.* No larger stock in U S No BETTER No cheaper. STARK BROS., 1st St., Louisiana, Mo.—Founded 1825; OLDEST. 1000 Acres; LARGEST.

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CATALOGUE of Fruit Trees, Grape Vines, Roses and Plants. F. WALKER & CO. 644 Fourth Avenue, Louisville, Ky.

Raise The BIGGEST **PONDEROSA TOMATO**

AND BOTH

GLORY and PROFIT AWAIT YOU.

so valuable that we paid $250 last year for the NAME alone when sold under the No. "400."

This year we think more of it than ever and to aid in making its merits still wider known we have doubled the amount of the money prizes.

NOW THEN FOR 1892 WE OFFER **$500.00**

for the heaviest single fruits raised from seeds of Ponderosa bought in 1892 in our sealed packets. Full details in Catalogue mentioned below, where also its fine qualities are told at length. It should be grown in

Every Garden in the Land

because the essential features of **EARLINESS, SIZE, WEIGHT, COLOR, SOLIDITY** and **QUALITY**, that make the ideal Tomato, this Ponderosa variety possesses in the superlative degree. Delicate persons will always prefer it because it is nearly seedless.

Price per packet 20c, 6 packets for $1, 12 packets for $1.75, 25 packets for $3.

DON'T FORGET, that with every order for a packet or more we will send FREE, our CATALOGUE of EVERYTHING for the GARDEN, (which alone costs us 25 cents) provided you will state where you saw this advertisement. This Catalogue of 150 pages is bound in illuminated covers, and is the largest and handsomest ever issued. It is replete with many engravings and colored plates of all that is new and desirable in SEEDS and PLANTS.

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SEEDS!

BEST IN THE WORLD!

OUR CATALOGUE for 1892, the handsomest we have ever published, completely revised, with hundreds of new illustrations; **2 colored plates,** and illuminated covers in 10 colors, will be sent **FREE!** to every reader of this paper for 30 days from date of issue, provided you mention the **name** of the paper and **date.** It contains all the **GOOD THINGS** in

VEGETABLE, FLOWER and FIELD SEEDS, BULBS and PLANTS

You will miss a **good thing** if you fail to secure a copy—and will **SAVE MONEY** by getting our prices before placing your spring order. Write for it at once.

NORTHRUP, BRASLAN & GOODWIN CO.,

Seed Growers, - Minneapolis, Minn.

TREES Fruit & Ornamental. **ROSES** **GRAPE VINES**

SPRING PLANTING

The largest and most complete general stock in the U.S., besides many Novelties. *New Illustrated* and descriptive priced *General Catalogue* containing important information for planters, **FREE.**

ELLWANGER & BARRY,

MT. HOPE NURSERIES, ROCHESTER, New York.

850,000 GRAPE VINES

100 Varieties. Also **Small Fruits, Trees, &c.** Best rooted stock. Genuine, cheap. 2 sample vines mailed for **14c.** Descriptive price list free. **LEWIS ROESCH, Fredonia, N. Y.**

$500 FOR A TOMATO!

Last spring I offered $500 to any person producing a 3 lb. **Mammoth Prize Tomato!** T. K. Harris Abbott, Neb., won it with one weighing 3 lbs. 3½ ozs., and I sent him my check for $500. It measured over 8½ in. in diameter. 37 tomatoes grew on one stem over 3 feet from the ground. Largest plant on record **18 ft. 6 in.** tall. This mammoth strain creates a sensation wherever it goes, and is the largest ever offered. Thousands of my customers have grown them to weigh over 45 ozs. The quality is excellent; after you once test it you will grow no others. If well cared for they will produce 1 bu. to a plant (see cut) of large, smooth, bright red tomatoes, very solid with only a few seeds in each, and entirely free from rot. If started early, fruit ripens from July 4th until frost. This year I offer **$500 Cash** to any person producing a 3½ lb. tomato. (It can be done.) Full directions how Mr. Harris grew his with each order. Plant some, you may win the prize. All my seed is saved from large specimens.

SURE HEAD CABBAGE

Is all head and sure to head, very uniform in size, firm and fine in texture, excellent in quality and a good keeper. Single heads have weighed over 64 lbs.

EARLY SNOWBALL TURNIP

Is the earliest in the world, easy grown, good size, excellent quality. Will be far ahead of your neighbors.

My Catalogue, is worth 50 cts. to any one who gets it. $500 offered largest order; $500 for a pansy blossom; $300 for a bean plant with 100 pods, and above tomato prize.

☞ I will send a packet each of Prize Tomato, Cabbage and Turnip, with my **Catalogue of Bargains** for only 25 cents. Greatest bargain catalogue ever sent out.

☞ Every person sending silver for above collection, will receive **Free** a packet **FINCH'S IMPROVED EXTRA EARLY TREE TOMATO,** and a 50 cent certificate for seeds, your choice from my bargain catalogue **FREE.**

J. B. MILLS, Rose Hill, Onondaga Co., N. Y.

RUMSON & MONMOUTH NURSERIES.

Upon our 250 acres of Nursery we have every family of **Trees and Plants** hardy in a northern climate; whether fruit, ornamental, nut, or flowering. Among the numerous choice new sorts are Lovett's Best Blackberry, Beebe and Lovett's Early Strawberries, Japan Wineberry, Green Mt. Grape, Lincoln Plum, Hardy Orange, Japan Walnuts, Ice King Primrose, Everblooming Spiræas, etc.

All are accurately described and quoted at half the price of solicitors in **Lovett's Guide to Horticulture,** the most complete and elaborate catalogue published by any nursery establishment in the world. The book is richly illustrated and is replete with notes on purchasing, planting, pruning, care and culture. Mailed free; with colored plates, 10c.

Shipments to distant points a Specialty.

J. T. Lovett Co., Little Silver, N. J.

HIGH Bred Seed Potatoes. One barrel worth two of Northern seed. All that grow Irish Potatoes should have my catalogue free with testimonials.

J. W. HALL, Marion Station, Md.

MATTERS OF BUSINESS.

(*Continued From Page* 146.)

the three hundred delegates attending the convention of the Mississippi Valley Cotton Growers' Association, at Memphis, Tenn., in January.

How to Spray.—The annual damage and loss to the fruit crop in this country, through blight, rot, mildew, rust, insects, etc., amounts to millions of dollars. Entomologists study every evil, and science has, to a large extent, found inexpensive remedies. In most cases, spraying is suggested, either with kerosene emulsion, Bordeaux mixture or some other prescribed remedy. Such work must be done at the right time or in the right way, or it had best be left alone. A manual on the subject, with formulas and receipts for preparing mixtures, has been issued by the Field Force Pump Co. of Lockport, N. Y., who will gladly send their book to farmers free, on application.

A Good Portable Fence.—The importance of having portable fences, that can be quickly erected where required, and removed from one part of the farm to another, becomes daily more apparent to every farmer in the country. At some time or other in the year, there is always some plat that he would like to have inclosed and wishes it would not take so long, or cost so much to do it. If the farmer will only send to the Empire Machine Co., of Richmond, Ind., he will get an illustrated catalogue of their fences and fence machines that will go far toward lightening his labors.

Eggs and Poultry.—Philadelphia, in one year, used 15,000,000 dozen eggs, worth $2,000,000, on the low basis of twelve and one-half cents per dozen. This daily average of 500,000 eggs was in addition to 7,500 barrels of poultry consumed there every twenty-four hours. As the population of Philadelphia is only one-sixtieth that of the whole country, our total annual consumption, on the same basis, would be 900,000,000 dozen eggs worth $120,000,000 and 450,000 barrels of poultry. It is usually placed much higher than this.

The Remarkable Growth of Chicago will continue both before and after the World's Fair. So valuable has real estate become that manufacturers are unable to find sites within the limits of the city, which really extends to whatever points factories may be located at. One of these is Griffith, which has the belt-line connection with all the railroads and the best of freight accommodations. The agents of this manufacturing point are Tay Dwiggins & Co., of Chicago, who will gladly give all information to intending investors in real estate at this promising town.

New York Poultry Show.—The third annual exhibition of the New York Poultry Show will be held in the Madison Square Garden on February 3d to 9th. Competition is open to the world, and from all indications it promises to be the largest and best exhibition of the kind ever held in New York City. Copies of the official premium list may be obtained from the secretary, T. Farrar Rackham, East Orange, N. J.

The Enormous Demand for Eggs, elsewhere referred to, makes farmers wonder what can be done to make their hens lay. Most farmers have ordinary or mixed breeds of fowls, and really pay but little attention to them. By using Sheridan's Condition Powder, advertised in this number, which is cheap and effective, they will soon find that a little extra expense and trouble brings back large returns.

Truckers' Delight.—This is the name of a fertilizer for all garden crops, offered by the Chemical Co. of Canton, Baltimore, Md. Wherever it has been given a fair trial, it has constantly gained in popularity. The company, whose advertisement appears on another page of this number, furnishes descriptive pamphlets to all applicants.

The Columbia Daily Calendar is a clever desk contrivance in the form of a pad containing 367 leaves, each 5¼x2⅝ inches; and each slip bears a short paragraph pertaining to cycling or some kindred subject, and at the bottom of each leaf is a blank for memoranda.

California Shipped East, last year, 6,300,000 gallons of wines, and of fresh fruits 79,000,000 pounds, raisins 48,000,000, dried fruits 74,000,000, canned goods 50,000,000, beans 40,000,000, potatoes 65,000,000, citrus fruits 75,000,000, and of sugar 105,000,000 pounds.

A Salary with expenses paid will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on page 152, "A Chance to Make Money."

Caton Stock Farm.—A. L. Thomas, Sup't Caton Farm, Joliet, Ill., remarks, "I inclose you amount for six bottles of Quinn's Ointment. After one year's trial must confess it does all you claim for it." For Curbs, Splints, Spavins, Wind-puffs or Bunches, try it. Trial box 25 cents, silver or stamps. Regular size $1.50 delivered. Address W. B. Eddy & Co., Whitehall, N. Y.

THE CHARMING MEXICAN PRIMROSE

Is the Grandest of all New Plants. It is strictly a perpetual bloomer, as it is in flower at all times of the year, a good specimen showing always from ten to thirty large saucer-shaped blossoms, about three inches across, of a beautiful, bright, clear pink color, veined with scarlet and with a white center. The superb color, combined with airy grace and beautiful form, goes to make a flower which is in beauty perfection itself. Each blossom keeps perfect many days before fading, and when it drops, others are out to take its place, and this succession of beauty is continued from one year's end to another. The plant is a free grower, succeeding in any soil or situation. As a window plant it combines great hardiness and ease of culture with unsurpassed beauty and delicate loveliness, and is truly a plant which has no superior. In the open ground it grows freely and blooms profusely all summer, and, in fact, until winter is upon it. Early frosts do not injure it, and it blooms on until frozen solid or covered with snow. It is a plant whose merits of hardiness, ease of culture, perpetual freedom of bloom, and unsurpassed beauty, both in color and habit, are offset by no faults whatever. It is the one most desirable new plant for the whole world. **FINE PLANTS, ALL READY to BLOOM, by MAIL POSTPAID, GUARANTEED to Arrive in Good Condition. 40 cts. each, 3 for $1, 7 for $2. Those ordering three or more plants may have a Manettia Vine free by asking for it.**

THE TRUE MANETTIA VINE The most magnificent flowering vine in cultivation, and is loaded with brilliant flowers every day in the year. The fame of its marvelous beauty is world wide. Fine plants **ALREADY BUDDED AND BLOOMING, 25 cents each, 3 for 50 cents.**

NEW PEACOCK PANSY. A Pansy of superb and varied color, showing the glorious and luminous bronze blue seen only in peacock feathers. It is the finest colored strain of pansy ever seen. **SEED PER PACKET, 25 CENTS.**

SPECIAL OFFER For **60** cts. we will send by mail one plant each of Mexican Primrose, Manettia Vine and pk't Peacock Pansy. Two of each for **$1.**

Also the Following Extra Choice Collections by Mail Postpaid.

12 Extra choice mixed Gladiolus, flowering bulbs.. 25c	5 Grand Lilies, 5 sorts named, including Auratum. 50c
6 New Double Pearl Tuberoses, flowering bulbs... 25c	5 Grand Cacti, different sorts named..... 50c
5 Rare Chrysanthemums, 5 sorts named..... 50c	3 Different rare new perpetual blooming plants.. 50c
4 Lovely Tea Roses, white, pink, yellow and scarlet 50c	6 Pkts. each rare new Flower, and Vegetable seeds 50c

A GREAT OFFER. For only $3.00 we will send postpaid all the collections, Primrose, Manettia and Pansy offered above. Order at once, as these offers may not appear again.

OUR BRONZE BLUE CATALOGUE (A superb work of art in bronze blue) of **FLOWER and VEGETABLE SEEDS, BULBS, PLANTS and RARE FRUITS,** is the most beautiful and complete ever issued. 152 pages, hundreds of Elegant Engravings, Stipple Lithograph Covers and **7 beautiful large Colored Plates.** We offer the finest standard varieties and novelties in Flower and Vegetable Seeds, Bulbs and Plants of all kinds and rare new Fruits. Also the greatest collection of rare Cacti, Flowering Shrubs, New Aquatic Plants, etc. Don't miss the Great Japanese Wineberry, Allsummer Raspberry, Water Hyacinth, Trailing Queen Fuchsia, Dwarf Orange, Mosquito Catcher Plant, Picture Rock Tomato, Stanley Potato, and hundreds of other Grand Novelties. **THIS MAGNIFICENT CATALOGUE WILL BE SENT FREE TO ALL WHO ORDER THE MEXICAN PRIMROSE OR ANYTHING HERE OFFERED. Or for only 20 cts. we will send CATALOGUE, Sample Copy of the MAYFLOWER and a packet of PEACOCK PANSY SEED.** We want agents in every town to take subscribers for our beautiful Monthly Horticultural Paper, **THE MAYFLOWER, 50c. per year.** Large Colored Plate with every number. Liberal premiums. Sample copy free. Address

JOHN LEWIS CHILDS, Floral Park, Queens Co., N. Y.

NEW TOMATO TRUCKER'S FAVORITE.

For Main Crop. **Very large,** smooth and solid. Good shipper, extra quality, ripens even and **don't crack.** Color purplish red. **25c.** per pkt., 5 for **$1.** For full descriptions, testimonials and col'd plates of these valuable entirely new vegetables send for our **1892 Descriptive Catalogue** of Seeds and Plants, a full list of tested Seeds, Grape Vines, Early Westbrook and other Strawberries, Blackberries, Raspberries, Currants, Champion Peach, &c., and all desirable Flower Seeds. It should be read by every one that plants seeds.

THE BEST MOST PROFITABLE **LIMA BEAN**

For MARKET GARDENERS and FAMILY. Earlier than Early Jersey and matures farther North—*extra large.* Most prolific. Grows very compact, and shells more quarts to the bushel of pods than any other. Quality absolutely the best. **25c.** per pkt. 5 for **$1.** Sold by us only.

JOEL HORNER & SONS, Delair, Camden Co., N. J.

SPRAY YOUR FRUIT TREES AND VINES

Wormy Fruit and Leaf Blight of Apples, Pears, Cherries, Grape and Potato Rot, Plum Curculio prevented by using **EXCELSIOR SPRAYING OUTFITS.**

PERFECT FRUIT ALWAYS SELLS AT GOOD PRICES. Catalogue showing all injurious insects to Fruits mailed free. **Large stock of Fruit Trees, Vines, and Berry Plants at Bottom Prices.** Address **WM. STAHL, Quincy, Ills.**

United States Department of Agriculture.

The Bureau of Animal Industry.—Pleuro-pneumonia Secretary Rusk regards as quite under control, and limited in territory to two or three counties on Long Island and in New Jersey, over which a thorough quarantine is exercised. Inspection, by American veterinarians, of cattle landed in Great Britain has been continued, as well as the inspection of such animals before shipment. Since the beginning of this work there have been inspected, altogether, up to October 1, 1891, 326,519 head of animals. A very slight decrease in the number of cattle exported is noted, which is attributed to the increase in price, cattle bringing in June, 1891, from $1.25 to $1.50 per head more than in June, 1890. The inspection of imported animals has been rigidly maintained. The result of the inspection of vessels, carrying export cattle, has been to materially reduce the losses resulting from lack of ventilation, overcrowding, and weak fittings; the total number of vessels examined since July 1, 1891, has been 215. The supervision, by the Bureau, of the movement of Southern cattle has involved the separation, and keeping distinct in transportation, over 40,000 cars, containing over a million head of cattle. While the results of this work have been highly beneficial, he asks for further powers, to enable him to compel a strict compliance with his regulations in the movement of all Southern cattle. Of the work of meat inspection, he says up to the 1st day of October there has been a total of 1,016,614 animals inspected, both before and after slaughter; there were 63,672 carcases of hogs examined microscopically, and the total number of animals condemned and sent to the fertilizing tanks was but 1,976. The cost of the work has been within the anticipated limit, and is being considerably reduced as the work proceeds. He says, "I am of the opinion that the inspection of animals, and their marking for identification, may be accomplished for a sum not exceeding three cents per head, and that the cost of microscopical inspection of hogs will not exceed five cents per animal." He earnestly recommends that Congress be asked to make an appropriation sufficiently large to extend the inspection to all applicants, and says, "The benefits which have already accrued by the opening up of the foreign markets to pork products, the increased demand for beef products, and the reëstablishment of their reputation for wholesomeness and soundness in the markets of the world, together with the protection which this inspection furnishes to our own consumers, amply justify a liberal appropriation."

Other Lines of Work.—The Department continues to encourage the production of such crops as are now largely imported. The new alcohol process in extracting sugar is a practical success, and Secretary Rusk looks confidently for the day when we shall produce the $100,000,000 worth of sugar we now import. He urges diversification of agriculture. The Division of Chemistry is doing good work on food adulteration, which is specially bad with coffee. No data is yet at hand that justifies any conclusions about making experiments. The report reviews, in some detail, the work of all the divisions of the Department, concluding with the statement, made advisedly, "that each one of more than a dozen divisions, whose work I have reviewed, has returned in actual value to the country during the past year far more than the entire annual appropriation accorded to this Department."

A Safe Warranty.—A. T., Kansas City, Mo., desires to know how to word a warranty in the purchase of a horse. A usual form of warranty is the following:

Received from —— $——for bay gelding (with star in forehead and off hind foot white to fetlock) warranted only——years old, sound, free from vice, and kind in all harness and under the saddle.

Signed,

O. K., Seller.

If immediately after the sale the purchaser can positively prove that this warranty was false in any one or more particulars, he can recover the money paid on delivering the horse to its former owner, and any damage from kicking, runaway, or injury to person. Unsoundness implies disease or disability in any degree that interferes, or is likely to interfere with the *natural usefulness* of a horse. A sound horse, is one in which there is no disease, nor any alteration of structure in any part which impairs, or is likely to impair his *natural usefulness*.

PUSHING A-HEAD

is not hard—if one has the best of everything to help him. First come seeds,—not merely seeds that grow, but that raise something worth growing. You want seeds of tested kinds and proved value.

Our "Money Grower's Manual" leaves all others out. The cream of all varieties, selected for those who plant for business. FREE, provided you send two 2c. stamps for postage, and mention American Agriculturist.

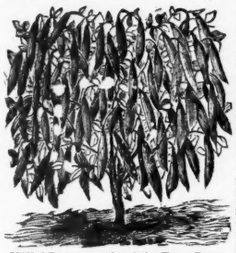
JOHNSON & STOKES, 217 and 219 Market St., **PHILADELPHIA.**

FREE **For 30 Days.** Wishing to introduce our CRAYON PORTRAITS and at the same time extend our business and make new customers, we have decided to make this Special Offer: Send us a Cabinet Picture, Photograph, Tintype, Ambrotype or Daguerotype of yourself or any member of your family, living or dead and we will make you a CRAYON PORTRAIT FREE OF CHARGE, provided you exhibit it to your friends as a sample of our work, and use your influence in securing us future orders. Place name and address on back of picture and it will be returned in perfect order. We make any change in picture you wish, not interfering with the likeness. Refer to any bank in Chicago. Address all mail to **THE CRESCENT CRAYON CO.** Opposite New German Theatre, CHICAGO, ILL. P. S.—We will forfeit $100 to anyone sending us photo and not receiving crayon picture FREE as per this offer. This offer is bonafide.

FARMERS AND GARDENERS—Do you want to make the heaviest paying investment of the age? One man last season received in return for an extra investment of $7 per acre over 150 bushels of Potatoes more per acre. You can do the same by using C. C. C. SPECIAL POTATO MANURE and TRUCKERS' DELIGHT. Special brands for each crop. Samples and circulars forwarded on application; expressage prepaid. We can make money for you. Local Agents wanted in all unoccupied territory. CHEMICAL COMPANY of Canton, Baltimore, Md., P. O. Box 407.

$300 FOR 100 PODS!

For years I have been improving the Tree Bean and this season, I am pleased to say my Improved Strain will beat anything yet offered. It grows about 2 feet high, branching out in all directions, bearing its pods so high that they seldom touch the ground, enabling it to stand a wet spell without injury. They have always been my specialty and yield immensely, often almost 100 pods each plant. I want a Plant produced by someone, containing 100 PODS and will pay $300 cash for it. Plant some, you may win the $300. Each package contains enough to plant 100 hills and full directions for culture.



Mills' Improved Prolific Tree Bean.

CORY SWEET CORN Is the earliest and best kind to suit all soils in the world. The ears are the largest and handsomest of all and if you once plant it all your neighbors will want some.

GIANT PERA CUCUMBER Is pronounced by all the finest ever grown: are best quality and grow from 15 to 22 in. long. Its beauty will surprise you. MY CATALOGUE is worth 50 cts. to any one who gets it. $500 offered largest order; $500 for a 3¼ pound Tomato, $500 for a Pansy Blossom, and above Bean Prize.

☞I will send a packet each of Improved Tree Bean, Sweet Corn and Cucumber with my catalogue of bargains, for only 25 cents. Greatest bargain catalogue ever sent out.

☞Every person sending silver for above collection, will receive Free a packet GOLDEN BALL TURNIP, earliest and finest variety ever grown, and a 50 cent certificate for seeds, your choice from my bargain catalogue FREE.

F. B. MILLS, Rose Hill, Onondaga County, New York.

401 Varieties Of BEST SORTS of Apple, Pear, Peach, Cherry, Plum, Quince, Strawberry, Raspberry, Blackberry, Currant, Grape, Gooseberry, etc. Also Chestnuts, Walnuts Trifoliate Orange, Eleagnus Longpipe, and other Novelties. ☞Send for Catalogue.

J. S. COLLINS & SON, Moorestown, N. J.

COLE'S (Illustrated) GARDEN ANNUAL FREE. **SEEDS.** The Best. Save Money in buying from us. Complete List. ☞EXTRAS with all orders. NEW MELON Earliest grown—Free. Address COLE'S Seed Store, Pella, Iowa.

SEEDS. 12 pkts. *Flower* 10c. 12 pkts. *Vegetable* 30c. 6 Dahlias 50c. 10 Gladiolus 30c. All $1. Half 50c. H. F. BURT, Taunton, Mass.

NOTICE.

Nursery closing. Last catalogue that will be issued by present proprietors ready, great bargains on small stock. P. H. FOSTER, Babylon, N. Y.

NUT TREES.

CHESTNUTS—JAPAN MAMMOTH and GIANT, Parry's, Japan Walnuts, JAPAN GOLDEN RUSSET IDAHO and Kieffer Pears, ELEAGNUS LONGIPES, HARDY ORANGES and other valuable novelties. Small Fruits, GRAPES, etc. Fruit, Shade and Nut Trees, Ornamental Shrubs, Vines, etc. Illustrative Descriptive Catalogue Free.

WILLIAM PARRY, Parry, New Jersey.

"THE WONDERFUL TOMATO." The testimonials received for Logan's Giant (3 lb.) tomato in 1891, excel by far those ever awarded any other tomato! Single tomatoes selling for 15c. Single plants ripening 30 lbs. Single stems selling for 60c. etc We ask all to send for proof of this before buying of others. Seed for five bushels 25c, 12 pkts. $1.

DAVID LOGAN & CO., Meadville, Pa.

FREE Illustrated Publications, with MAPS, describing Minnesota, North Dakota, Montana, Idaho, Washington and Oregon, the FREE GOVERNMENT AND CHEAP NORTHERN PACIFIC R. R. **LANDS** Best Agricultural Grazing and Timber Lands now open to settlers. Mailed FREE. Address CHAS. B. LAMBORN, Land Com. N. P. R. R., St. Paul, Minn.

SEATTLE the Metropolis of **WASHINGTON.** Send stamp for "Travels of Brother Jonathan" to Eshelman, Llewellyn & Co., Seattle, Wash.

GENUINE STANDARD SINGER Sewing Machines. Latest Improved. Best made. Noiseless. Warranted 5 yrs.

SAVE MONEY now while you can get a Complete set of attachments FREE. Adapted for light or heavy work. Light running. Nicely finished. Send for catalogue.

$35.00 Machine for	$9.50	
$45.00 " "	$14.00	
$55.00 " "	$18.50	

CASH BUYERS' UNION, 358-366 Dearborn St. B. 81, Chicago.

Write To Clarks Business College, ERIE, PA. for "SPECIAL OFFERS!" Best in America

MONEY made rapidly selling the "New Model Hall Typewriter." Agents allowed better commissions than any ever before offered by a standard company. Sell a useful article, please everybody and make money yourself. It will pay you to address N. Typewriter Co., Boston, Mass.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

The Late F. W. Anderson.

Fred. W. Anderson was born in Wisbech, Eng., June 22, 1866. His first schooling was at the age of five years. Love of nature was born in him, and he already showed at this tender age a keen interest in flowers. When he was twelve years old he was sent to a private school in the historic town of Epworth, where he was presented with a primary text-book of botany, which gave form and direction to the studies he had been vaguely pursuing.

When in his fifteenth year his father emigrated with his family, and settled in Chicago. The boy's decided talent for drawing procured him employment in a large lithographing establishment. But city life was irksome to him, and after a few months he left Chicago, spending a year on the farm of a relative near El Paso, Ill., and another on a Kansas sheep ranch. His parents had meanwhile removed to Minneapolis. After a brief visit there, early in 1883, he went to Montana. The

next five years were filled with toil, study, hardship and achievement. Around him was a new, wonderfully rich and varied flora, to the study of which he devoted himself with enthusiasm. He had the good fortune to make the acquaintance of Rev. F. D. Kelsey, of Helena, an accomplished botanist and Christian gentleman, who directed and assisted him in his studies. Sometimes his vigorous and facile pen found employment from the local papers, and at others he turned his early experience at sheep ranching to account. But, as Mr. Kelsey writes us, "all this struggle was a voluntary sacrifice laid on the altar of science. He had rare gifts which, if turned to money-making, would have placed him far above want. But his love for science was such that he was utterly unhappy at any other pursuit."

At length the light broke in upon his life from an unexpected quarter. In June, 1888, an excursion party, which included Hon. Norman J. Colman, United States Commissioner of Agriculture, visited Great Falls. Here young Anderson was introduced to the Commissioner, who readily recognized in him talents which he could turn to good account. On his return to Washington he sent Anderson an appointment as special agent of the Department to report on the pastoral resources of Montana. His report, which was published in due time, was a masterpiece of scientific accuracy. It gave Anderson at once a recognized place in the world of science. After completing his work for the Department in the field, and in Washington, he went to New Jersey to prepare drawings for a great work on fungi, by J. B. Ellis. These plates are a monument to his skill in mycological drawing. He was afterwards recalled to the Department of Agriculture, where he remained until October, 1890, when he came to New York and entered the office of the AMERICAN AGRICULTURIST as assistant editor. His work here, both with pen and pencil, was always well done. His leisure hours were devoted to illustrating Mrs. N. L. Button's forthcoming work on American mosses, which work he performed with characteristic enthusiasm. In 1890 the College of Montana conferred on him the honorary degree of Doctor of Science, in acknowledgment of his earnest labors in describing the flora of that State.

Early in December he was attacked with swelling near the right ear, which developed into a tumor, and ended his life on December 22d. With all his gifts, one of the greatest was that of inspiring the sympathy and cordial friendship of all with whom he came in contact. His early death is a loss to science, and a bitter bereavement to the many who knew and loved him.

THE DINGEE & CONARD CO'S
ROSES
ARE ON THEIR OWN ROOTS,
and cost no more than the other kinds.
Propagated and grown by special methods of our own, they will GROW and BLOOM wherever grass grows and water runs.
We are by far the largest Rose growers in America, annually giving away in Premiums more than most others produce.
Our Special Mail System insures free, safe, and satisfactory delivery everywhere, and makes us as good as next-door neighbors to every lover of flowers.
Our New Guide for 1892
will surprise and delight you. It has over 100 pages, magazine size, with handsome illustrations, honest descriptions and helpful hints; giving plain directions how to get and how to keep upwards of 2,000 varieties of
ROSES, BULBS, HARDY PLANTS, and SEEDS.
It is sent to any one free for the asking, and places at your disposal—in twenty-five minutes—what it has taken us twenty-five years to acquire.
THE DINGEE & CONARD CO., Rose Growers and Seedsmen, West Grove, Pa.

WILSON'S 1892 PLANT, TREE AND SEED CATALOGUE. LIVE STOCK ANNUAL.
112 Pages, 200 Fine Engravings, Handsome Colored Plates. Full of useful and instructive information. One of the most reliable catalogues published. Describing all kinds of guaranteed Garden, Flower and Field Seeds, Fruit and Ornamental Trees, Small Fruits, Choice Roses, Flowering Plants and Bulbs. Thoroughbred Land and Water Fowls, Registered Pigs, German Hares, &c. Sent free, on application. Address, mentioning this paper,
SAMUEL WILSON, SEED GROWER MECHANICSVILLE, PA

SEEDS 12 GREEN-HOUSES. CANNAS, PANSIES, CARNATIONS, JAPAN LILIES, HARDY BULBS. NORTHERN VERMONT SEED POTATOES. ROSES SMALL FRUITS PEAS, ONIONS SWEET CORN. C.E. ALLEN BRATTLEBORO, VT. LARGE CATALOGUE FREE

STRAWBERRIES AND FINE FRUIT.
I have of my own growing 70 varieties of Strawberries and will fill all orders from 6 plants to 50,000 and do it promptly. Try Early Idaho for the earliest. Dew for great beauty. Anna Forrest for the largest. Great Pacific for the coming strawberry. Oregon Everbearing for a supply all summer. Try Eureka, Warfield, Haverland, Bubach, Gandy, Jessie and Michel's Early for standards. Try Palmer and Progress Raspberries. Sweet Hamburg Blackberries. Stuart's Golden apples. Idaho and Wilder Pears. Abundance, Satsuma and Burbank Plums. Champion Peaches. Wine Berries, Buffalo Berries, Shense Apricots are hardy and equal to the famous California Best. 50 page Catalogue and reports on strawberries free. D. BRANDT, Bremen, Ohio, Box 55.

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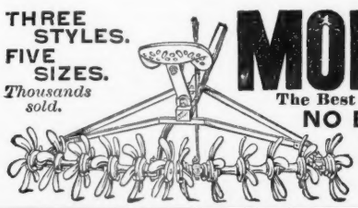

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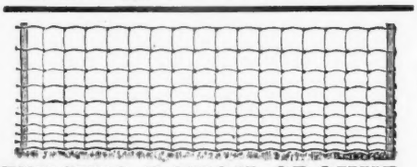

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Ball Bearings save horse flesh and repairs. **Double Levers** fit hilly ground.

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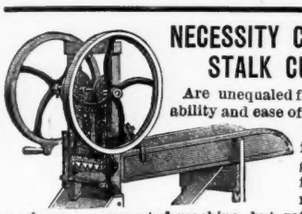

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Are unequaled for capacity, durability and ease of operating. Every machine is warranted to give Entire Satisfaction or money refunded. Buy no cheap, unwarranted machine, but get the best. You can save 50% in cost of feed, by using our Clover Cutter for your poultry, or our Stalk Cutter for your stock. Circulars free. Agents wanted.

NECESSITY M'F'G. CO., Dawson, Pa.

ANIMAL AILMENTS.

Bad Feeder.—T. J. Murphy, Chemung Co., N. Y., has a five-year-old Hambletonian gelding, used moderately as a road horse for past year. He seems startled, and is usually out of condition. Will not eat much hay or grain. Has had a soft swelling occasionally on the side of the jaw. This condition has existed the past year. Give an aloes ball, once in two weeks. Feed ground oats and wheat middlings, two parts of the first, and one of the latter, to which a handful of whole linseed, and one of powdered gentian is added. Give a handful of clean hay at night only, moistened. Small feeds only should be given. Let him call for more before increasing the quantity. Regular grooming and full and healthful exercise, daily, should be given.

Nasal Catarrh of Cow.—Joseph Ainsworth, Logan Co., Idaho, writes us that he has a valuable cow that has a discharge from the nose. There is no sore or swelling. The cow seems well in every respect except as indicated by the discharge from the nose. Give half a pound of Glauber's salts in small quantities of bran slop, night and morning, till it operates. A handful of flaxseed meal in the slop will be useful. With a long-piped vulcanized rubber syringe, night and morning, cleanse the nostrils nicely and gently, then throw in the following solution. Sulphate of zinc half a pound, to warm water two quarts. Keep the solution bottled, as it is poison.

Hernia of Young Colt.—H. C. North, San Diego Co., Cal., asks for information about what to do for a ruptured horse colt a month old. He lately became ruptured from running too fast on a hard road. The mare was let out and hence the consequences. The rupture is so far up as to prevent the use of any kind of support. The best thing to do in such a case is castration. But this operation cannot be performed for some months. Hence, the necessity of comparative rest till this operation has been completed. If urgent demand makes it necessary, a shallow, rubber suspensory bandage may be used held by tapes up over the loins, attached to a crupper, from which other tapes run behind, and between the thighs on each side. These tapes should have elastics fastened in the middle of each. Though difficult, this method may prevent the increasing size of the rupture.

Kicking Horse.—Joseph Markie, Grand Forks, Dak., writes us: "I recently purchased a fine, likely young mare that is a kicker. I bought her for such and such, and she is! Can she be cured? If not, what can I do with her? She is as pretty as a picture." A kicking beauty is just as bad as any ugly, kicking brute. If any horse-tamer in your section will guarantee to cure her of this viciousness, let him try. If he fails she may be put to breeding, for, ten to one, the vice was acquired. Reformed kickers are ticklish customers.

Warts on Cows' Teats.—W. W. Dunham, Travis Co., Texas, desires information how to remove warts from cows' teats. They are dry and horny and have been on since the cow was a year old. They are only on sides of teats, except one on navel three inches long. With a pair of sharp, curved scissors, cut the warts as close as possible without wounding the skin. Then paint the roots of the warts with tincture of iodine, with a camel's-hair pencil. This should be done thoroughly. Should any of them reappear, give another application of the iodine. Even then, some obstinate wart may again come, when it may be advisable to use nitric acid. This should be applied by means of a finely pointed pine stick, dipped in the acid, and applied by repeatedly dotting the root of the wart. Care should be taken not to spill the acid on the flesh, nor to smear it over the healthy surface. The teat should be held so that the acid will penetrate the roots.

Stomach Stagger—Mule Breeding.—W. K. Wellington, Davidson Co., Tenn., writes us: "I would like to ask what ails a fine and valuable horse I purchased at a fair, for riding over the country in search of a location. For this country, I paid a big price for him. He is a large, fat, fine looking animal, and a superb saddle horse, five years old and perfectly broken to a walk, dog-trot, and canter. He looks well-bred. When I ride him hard, and feed him liberally on corn, he has dizzy spells, and staggers about like a drunken man. After this passes off he is dull. What shall I do for him? I like him so well I do not care to sell him." This is one of the very common results of purchasing horses from a stranger. You should have gone to the most reputable breeder in that section, or in Kentucky, told him what you wanted, tried the horse for several days, looked into his feeding and management, and paid a pretty good round sum for him, and in the end you would have saved money. Give your horse an aloes ball, feed only ground oats and wheat middlings equal parts, three quarts three times daily and water, all with regularity. Ride him moderately every day. An occasional handful of whole flaxseed thrown into the feed will keep his mind and coat in good condition. If he does not perfectly recover in a month, part with him though at a considerable loss.

As to *Mule Breeding*, we would advise you to go to the best breeding establishment in your State

(*Continued on Page* 155.)

AYER'S Sarsaparilla

Y-our best remedy for
E-rysipelas, Catarrh
R-heumatism, and
S-crofula.

Salt-Rheum, Sore Eyes
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AYER'S Sarsaparilla

Prepared by Dr. J. C. Ayer & Co., Lowell, Mass.
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Cures others, will cure you

DONALD KENNEDY
Of Roxbury, Mass., Says:

Strange cases cured by my **Medical Discovery** come to me every day. Here is one of Paralysis—Blindness—and the Grip. Now how does my **Medical Discovery** cure all these? I don't know, unless it takes hold of the Hidden Poison that makes all Humor.

VIRGINIA CITY, NEVADA, *Sept. 9th*, 1891.

Donald Kennedy—Dear Sir: I will state my case to you: About nine years ago I was paralyzed in my left side, and the best doctors gave me no relief for two years, and I was advised to try your **Discovery**, which did its duty, and in a few months I was restored to health. About four years ago I became blind in my left eye by a spotted cataract. Last March I was taken with La Grippe, and was confined to my bed for three months. At the end of that time, as in the start, then it struck me that your **Discovery** was the thing for me; so I got a bottle, and before it was half gone I was able to go to my work in the mines. Now in regard to my eyes, as I lost my left eye, and about six months ago my right eye became affected with black spots over the sight as did the left eye—perhaps some twenty of them—but since I have been using your **Discovery** they all left my right eye but one; and, thank God, the bright light of heaven is once more making its appearance in my *left* eye. I am wonderfully astonished at it, and thank God and your **Medical Discovery.**

Yours truly,
HANK WHITE.

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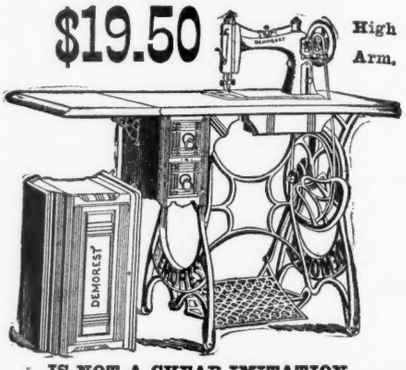
$19.50 High Arm.



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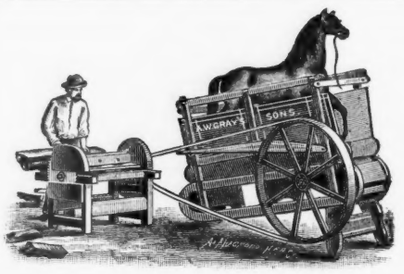

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Very truly yours, M. J. McGINNIS
All who are interested in **Horse Powers, Wood Saws** or **Threshing Machines** are invited to write for 50 page pamphlet. **Free.** Address
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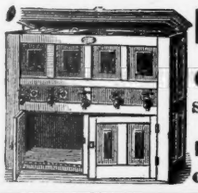

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FOR TWO HORSES.
Gives **better work, more of it, with less work to team** than any others.
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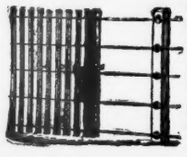

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Weaves to the posts. Best in the world. Thousands in use. Guaranteed. Freight paid. Agents are reporting big sales. Machines, Wire, etc., at wholesale direct to Farmers where I have no Agent. Catalogue free. Address the manufacturer, **S. H. GARRETT, MANSFIELD, OHIO.**

ANIMAL AILMENTS.

(*Continued from Page* 154.)

or Kentucky, and purchase the best, large jack you can get. Next, and it is just as important, get at the same time and place the best mares as you require. Breed for a purpose. If for heavy work, large, sound, and young, half-bred mares will meet your requirements. If, however, you desire fleet-footed animals for the road, both the jack and mares should possess these characteristics. They should be good-sized animals of the trotting breeds. Remember that generous feeding of breeding stock is very essential for success in the stud.

Non-Breeding Instinct.—H. Erbsmehl, Queens Co., N. Y., has a well-bred Jersey cow, three and one-half years old, which had her second calf five months ago and yet shows no signs of the breeding desire. The signs may have been overlooked. If not, feed ground oats with an ounce or two of ground ginger, night and morning. This may be occasionally substituted with a pint of peameal and a pint of flaxseed meal. First indications of heat should be carefully watched.

Heart Malformation in a Pig. — James McTucker, Bingham Co., Idaho, has a litter of pigs six weeks old. Five of the pigs are healthy and fat, while one is believed to have the thumps. This is probably a case of malformation or functional affection of the heart of the pig. The affection is not contagious, nor is it amenable to treatment. In such cases it is most economical to slaughter the animal as soon as it can be fattened. The meat will not be unhealthful.

Spaying Cows.—C. H. Harris, Hyde Co., South Dakota: As a rule, it is not advisable to spay a fairly good cow, nor a poor one, for it will but rarely prove satisfactory. A cow that requires to be operated on to make her valuable is a myth. It is not worth while to spay a poor cow, as her value can be sooner reached by fitting her for the butcher. A good cow is good enough without the torture and danger of loss from so painful and dangerous an operation as spaying. A cow, well fatted, makes good enough beef if not old or drained by long milking. Dr. A. Liautard's work on castration (price $2) contains a full chapter on this subject.

Chicken Cholera.—E. H. Sellers, Erie Co., N. Y., wishes to know how to prevent chicken cholera, and a recipe for its cure. Keep your chicken-house and run scrupulously clean. Keep clean, fresh water within reach of the fowls. Keep drinking water in iron vessels. Add daily to every pail of water used for the fowls to drink, one dram of sulphate of iron and one ounce of crude carbolic acid. Feed only sound food. Parched corn, buckwheat, oats, wheat, wheat bread, corn bread, and meat scraps from the table should be alternated so as to give a frequent change. Boiled potatoes make a good change for a feed or two.

Contagious Pleuro-Pneumonia.— This dread disease shows marked symptoms which cannot be easily misunderstood. Twenty to thirty days after exposure to an infected animal, the cattle have a fever that runs up to 103° to 105° F. early in the attack. The cough is peculiarly thrilling, the nose is protruded and a number of cattle in the herd are similarly affected. The animals refuse to move, and when compelled to do so seem stiff and sore. The hind feet are frequently raised. The patients hang their heads, arch the back, and have every appearance of very sick animals. As infectious diseases are liable to inflict serious damage upon the country, it is the duty of every one, knowing the existence of such diseases to notify the proper authorities of every well-grounded suspicion, so that the veterinary inspector should promptly verify or disprove the suspicion, and thus prevent the spread of the contagion. This is really practicing the golden rule.

Garget.—George G. Meacham, Broome Co., Wy. asks the cause and cure of garget. This malady is an inflammation of the mammary gland of the cow. It may be a catarrh or inflammation of the mucous lining of the minute milk tubes, inflammation of the skin covering the udder, or inflammation of the substance of the gland. The absorption of decomposing or putrid matters is the cause of

(*Continued on Page* 156.)

Dread Catarrh

This is the greatest SCOURGE of our climate, and there are very few people who have not at least a slight CATARRHAL TROUBLE. It may manifest itself only as a COLD, which does not readily wear off; and there are all variations from this condition to that of a continual dropping of mucus in the throat, and a partial deafness, with noises in the head, which make life a burden. **AERATED OXYGEN** is a positive and permanent cure for this terrible disease. As the OXYGEN treats CATARRH it does CONSUMPTION, ASTHMA, BRONCHITIS, & all diseases of the breathing organs. **AERATED OXYGEN** is a HOME treatment and is sent by express to any part of the world.

Write for our **FREE BOOK** of wonderful cures. We have eminent physicians who may be consulted **FREE.** **AERATED OXYGEN COMPOUND** is *Only One-Third* the price of other Oxygens, and is for sale only by the

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Have the neatest, cheapest and latest thing out in Bath Tubs. *No bath room needed.* An ornament to any room. A child can operate it. Can use oil, gasoline, gas or natural gas; heats 20 gallons of water in 25 minutes. The great expense of putting in heating boiler and range or furnace with cold and hot water pipes entirely done away with.

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WORST CASES CURED TO STAY CURED IF UNCOMPLICATED BY ORGANIC DISEASE. Incurable cases declined.

WE WANT NAME OF EVERY ASTHMATIC. *Examination free by mail.*

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SEND FOR CIRCULAR. E. KRAUSER & BRO. MILTON, PA.

CLAREMONT LAND ASSOCIATION, Claremont Surry Co., Va. Offers 600 choice farms; 3,000 heads' home town lots on James River, with terms to suit purchasers. Free circular

GRAPE VINES Small Fruits.

All old and new varieties. Extra quality. Warranted true. *Lowest rates.* New Descriptive Catalogue Free. T. S. HUBBARD CO., FREDONIA, N. Y.

NEW HOT-HOUSE LETTUCE.

Send for our **1892** illustrated **Hand Book** for the farm and garden. It gives a complete list of all the leading and reliable kinds of **Vegetables** and **Flowers** with a full description, and is illustrated with colored plates, painted from nature. With our extensive trial grounds in addition to the **TEN ACRES** under glass, affords us facilities unsurpassed by any other house, for testing only the germinating quality of the seed but of seeing them come to maturity, the benefit of which is given to our customers. A few of our **specialties** for forcing are:

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Rawson's White Spine Cucumber,	**pkt., 10c.**	
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A full description of these is given in our 1892 catalogue, which is illustrated with cuts and colored plates painted from nature, making it not only a handsome book, but one of usefulness to all interested in gardening, either for vegetables or flowers. Write at once, sending 25 cents, and this collection will be mailed *post-paid* and our beautiful illustrated catalogue.

DR. S. C. MOYER LANSDALE, PA., Breeder of B. P. Rocks, W. & S. Wyandottes, L. Brahmas and Anconas. Eggs and stock for sale.

FOWLS.—Am selling my Entire stock of Prize birds of 20 varieties. Price list free. Chance to obtain the best. **JOS. BOSLER, JR.,** Carlisle, Pa.

FARMERS' HARD WOOD CABINET CREAMERY and Cash Registers. For particulars write AMERICAN MANUFACTURING CO., Waynesboro, Pa.

ANIMAL AILMENTS.

(*Continued from Page* 155.)

garget, and so are congestion of the milk tubes and blocking up of the natural secretion. Early and prompt treatment is indispensable to perfect cure. Give half a pound of Glauber's salts, night and morning, in thin wheat-bran slop; foment the udder, and extract the milk gently, rubbing the udder downward, with warm lard. Keep the cow warm and dry.

Warbles—Boils.—H. B. Hillyer, Bell Co., Texas, has a yearling Holstein heifer that has lumps or bunches on the back. He asks what they are and how to cure them. In the summer large flies torment cattle by depositing their eggs in their backs. This is *oestris bovis*. The eggs hatch, causing suppuration, and the pupa of the fly, almost mature enough to propagate its species, drops out. These may be evacuated at almost any stage of growth by opening with a sharp-pointed knife. The pupa should be destroyed. The Jersey cow that receives the best of care, and yet has a series of boils on her udder, should be given a quarter of a pound of Glauber's salts every night, in a pail of wheat-bran slop, and fed roots instead of corn.

Bunch on Leg of Colt.—C. Smith, Snyder Co., Pa., has a fine Arabian colt, four months old, that was stepped on by its mother, making a cut on the side of the leg, leaving a hard, unsightly bunch. Rub in a scruple of biniodide of mercury ointment, two or three times a week, and cover with a bandage after application.

1892.

We have made unusual preparations for the Opening Season of 1892.

This is the time for Receptions, Weddings, and anniversary festivities which call for Evening Dress. Good Taste and Fashion require for such events the use of Silk Fabrics.

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WHOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

Secretary Rusk's Views.

"I am amazed," writes Mr. Rusk, Secretary of the United States Department of Agriculture, referring to the editorial in the January number, "that the AMERICAN AGRICULTURIST could find in my report a tendency to the partial exclusion of the importance of the Statistical Division. If there is any one thing which I have emphasized so clearly that he who runs may read, since I have been Secretary of Agriculture, it is the importance of extending the scope and work of our Statistical Division, and especially of extending its scope to cover foreign markets. If you will refer to Page 58 of my report you will find that I informed the President that my personal attention has been especially devoted to three principal objects, the very first one of which I stated to be the extension of the market for the disposal of the surplus of our great staple crops, including the cereals, and especially our vast animal products. Now, how could such an object be contemplated, much less executed, without broadening the work of the Statistical Division, upon which I must depend for the information necessary to the accomplishment of that very first object?

"If you have observed the monthly crop reports during the past year, you must have noticed that, in addition to maintaining to the full the extent and reliability of our crop reports, they have presented, for the information of the farmers, interesting and exhaustive reviews regarding the agricultural resources of the States of South America, with many of whom it was hoped that reciprocal treaties might be made by which advantage might accrue to our farmers. You will have, doubtless, observed that the first exhaustive presentation of the new rates of duty imposed under reciprocity treaties, already effected, was to be found in the monthly statistical report of last October. As to the dissemination of the information in this Division, the preparation of the four-page synopsis for distribution directly to the farmers and farmers' papers, in advance of the regular crop report, was undertaken under my administration, and the popularity of this measure is sufficiently attested by the fact that we now issue over 125,000 of these, monthly, to satisfy the demand.

"Your suggestions in connection with the work of this Division are good enough, but that you should have overlooked what has already been done towards the accomplishment of these very suggestions, and that you should be able to find anything in my last report, or in any of my reports, indicating a tendency to restrict the scope and influence of this Division, as I said before, fills me with amazement."

The AMERICAN AGRICULTURIST gladly prints the above, which but reiterates the recent progress made by the Department of Agriculture that has been so fully noted in these columns from month to month. In addition to the broad plans which Secretary Rusk outlines in his annual report, the Division of Statistics ought to have $300,000 for its work in collecting domestic and foreign crop and market reports. This is three times the appropriation of recent years. The AMERICAN AGRICULTURIST, in its October, November and December numbers, outlined its views in this connection with such detail that they need not be repeated here. The dissemination of such crop and market reports, in addition to being furnished to the press, will not be satisfactory to the farmer until "a system of cheap telegraphy, frequent mails and free delivery" enables him to receive the same with his daily weather report. All this is a work of years.

Death of A. B. Allen.

As we go to press the painful news reaches us that Anthony B. Allen, the founder and first editor of the AMERICAN AGRICULTURIST, died at his home in Plainfield, N. J. on January 12th, at the venerable age of ninety years. It is gratifying to note that he lived to see the semi-centennial number of the AMERICAN AGRICULTURIST in which appears the last article that he wrote for publication. An excellent portrait of Mr. Allen, when he was about fifty-eight years old, appears on the frontispage of our January number.

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Arborville, Neb., Dec. 26, 1891.

The Owen Electric Belt Co., Chicago, Gentlemen:—I did not buy one of your belts for myself, but I bought three for different friends. From each and all of these I have a good report. Not one is dissatisfied, but they believe with me that the electric treatment is far preferable to drugs. They are all ready to call your company benefactors of the race. Yours truly, S. ENSIGN.

A HELPLESS SUFFERER WITH RHEUMATISM

Gives the Result of Six Days' Treatment with The Owen Electric Belt.

Madison Lake, Dec. 9, 1891.

Dr. A. Owen, Chicago, Ill., Dear Sir:—I desire to let you know, for the benefit of others, the experience we had with your Electric Belt.

My wife had rheumatism, with severe pains in the back, for the last three years, which, since last June, had become so severe that she was not able to turn in bed alone. In fact, she was perfectly helpless. We tried many forms of relief, but without doing any good. I at last concluded to try your Ladies' Electric Belt, which I sent for, and it came promptly by express. We then applied it according to directions and with the following result: First day, put on belt with five cells, and, after wearing it six hours, felt no effect. Second day same as first. Third day increased power to eight cells, felt effects only mild. Fourth day increased to full power, felt effects instantly; after wearing two hours began to burn and blister. Fifth day reduced to eight cells, continued to burn and blister. Sixth day reduced to six cells with good result, and have worn belt every day since up to date, and can gladly state that the benefits received are astonishing. Pain in back almost gone. Rheumatism greatly relieved, and I think another week will see her entirely free from pain. You will not be surprised to hear that we felt a little doubtful about its usefulness after the first two days' trial, but made up our minds to give it a fair trial. I am pleased to write this account to you, hoping it will come under the notice of those afflicted, and receive my hearty thanks for your prompt and honorable dealings. I remain, yours truly.

W. L. RAPPLEY, Madison Lake P. O., Blue Earth Co, Minn.

P. S.—Please use this as you think best. I shall write again in the course of two weeks.

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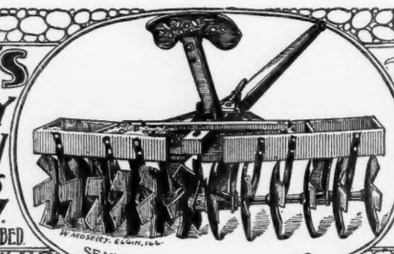

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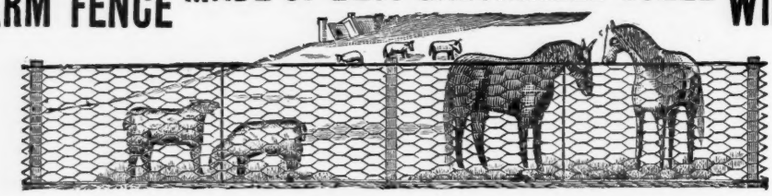

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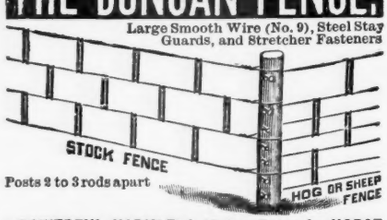

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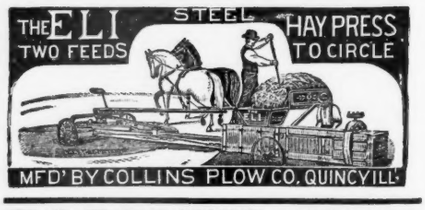

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OUR LIBRARY CORNER.

HAND-BOOK OF INDUSTRIAL ORGANIC CHEMISTRY: Adapted for the use of Manufacturers, Chemists, and all interested in the Utilization of Organic Materials in the Industrial Arts. By Samuel P. Sadtler, Ph. D., Chemical Editor of the "United States Dispensatory," Professor of Organic and Industrial Chemistry, in the University of Pennsylvania, and of Chemistry in Philadelphia College of Pharmacy, Fellow of the Chemical Societies of London and Berlin, etc. Published by J. B. Lippincott Co., Philadelphia, 1891. Cloth, 8vo., pp. 519.

The importance of this volume to those specified in the title cannot be overestimated. Being new, and quite up to date, it has a great advantage over the older works, mostly translated into English from continental authors, and which, of necessity, do not treat of the latest and most perfect methods employed in the industrial arts. The treatment of the different classes of subjects, in the present work, is methodical. First, the raw materials which serve as the basis of the industrial treatment, are enumerated and described; second, the processes of manufacture are given in outline and explained; third, the products, both intermediate and final, are characterized, and their composition illustrated, in many cases, by tables of analyses; fourth, the most important analytical tests and methods are given, which seem to be of value, either in the control of the processes of manufacture, or in determining the purity of the product; and, fifth, the bibliography and statistics of each industry are given, so that an idea of the present development and relative importance of the industry may be had. It is impossible here to give a *résumé* of the contents of the volume, but the following headings of chapters will give a slight idea of its great comprehensiveness: Petroleum and Minerals Oil Industry; Industry of the Fats and Fatty Oils; Industry of the Essential Oils and Resins; The Cane Sugar Industry; Industries of Starch and its Alteration Products; Fermentation Industries, which includes malt liquors, wine, distilled liquors, and ardent spirits, bread-making, and vinegar; Milk Industries; Vegetable Textile Fibers; Textile Fibers of Animal Origin; Animal Tissues and their products; Industries Based Upon Destructive Distillation; Artificial Coloring Matters; Natural Dye Colors; Bleaching, Dyeing, and Textile Printing. Each of these chapters comprehends all products of and from the various materials in its class. The Appendix contains the Metric System; Tables for Determination of Temperatures; Specific Gravity Tables; and Alcohol Tables, followed by a list of illustrations and a first-class index. Sold by the Orange Judd Co. Price $5.

THE MOUNTAINS OF OREGON: By W. G. Steel, Fellow of the American Geographical Society; cloth, pp. 112.

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RACKHAM'S INTERNATIONAL DIRECTORY OF PIGEON BREEDERS: By T. Farrar Rackham; paper, pp. 56.

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AMERICAN LANGSHAN CLUB: Fall Catalogue, 1891; paper, large 8vo., pp. 101. Willard P. Smith, Secretary, Box 2,600, New York City.

Well printed on good paper and copiously illustrated, this catalogue is worth saving for reference. The Langshans are thoroughly discussed in able articles by prominent breeders, and points in judging are given, besides a list of the officers and members of the Club, and a full index.

FROM THE EXPERIMENT STATIONS.

UNITED STATES DEPARTMENT OF AGRICULTURE —Preliminary Report of the Secretary of Agriculture, 1891; Division of Statistics, Report No. 90 (new series), November, 1891, report on yield of crops per acre, freight rates of transportation companies; Division of Botany, Bul. No. 14, ilex cassine, the aboriginal North American tea; Entomological Division, insect life, Vol. IV, Nos. 3 and 4, November, 1891; Office of Experiment Stations, Experiment Station Record, Vol. III, No. 3, October, 1891. During December, use of maize in Europe and the possibilities of its extension; Division of Vegetable Pathology, Bul. No. 1, additional evidence of the communicability of peach yellows and peach rosette; Weather Bureau, monthly weather review, July, August and September, 1891; Office of Experiment Stations, Experiment Station Record, Vol. III, Nos. 4 and 5.

ALABAMA—Canebrake Exp. Sta. at Uniontown, Bul. No. 12, October, 1891, grapes, strawberries, and raspberries.

ARKANSAS—Exp. Sta. at Fayetteville, Bul. No. 16, July, 1891, ringworm.

ARIZONA—Exp. Sta. at Tucson, Bul. No. 3, October, 1891, irrigation in Arizona; Bul. No. 4, November, 1891, waters and water analysis.

CALIFORNIA—Exp. Sta. at Berkley, Bul. No. 95, December 10, 1891, distribution of seeds and plants.

COLORADO—Exp. Sta. at Fort Collins, Bul. No. 16, July, 1891, artesian wells of Colorado.

FLORIDA—Exp. Sta. at Lake City, Bul. No. 14, July, 1891, annual report; Bul. No. 15, October 1, 1891, tobacco and its cultivation.

ILLINOIS — Exp. Sta. at Champaign, annual report, 1890-91.

INDIANA—Exp. Sta. at La Fayette, Bul. No. 37, December, 1891, steer feeding, a comparison of cut with uncut clover, composition and valuation of Indiana feeding stuffs.

KANSAS—Exp. Sta. at Manhattan, Bul. No. 24, September, 1891, enzoötic cerebritis, or staggers of horses.

LOUISIANA — Exp. Sta. at Calhoun, Bul. No. 11 (second series), report of the sugar house and laboratory for 1890; Bul. No. 12 (second series), analyses of commercial fertilizers and other substances useful to agriculture.

MASSACHUSETTS—Hatch Exp. Sta. at Amherst, meteorological Bul. No. 34, October, 1891; meteorological Bul. No. 35, November, 1891.

MISSOURI—Exp. Sta. at Columbia, Bul. No. 16, November, 1891, covering peach trees to protect the fruit buds, spread of pear blight, temperature and rain tables, strawberry tests, potato trials, seedling fruits.

MICHIGAN — Exp. Sta. at Agricultural College, Bul. No. 77, November, 1891, comparing the yield of old meadows with those recently seeded.

MISSISSIPPI—Exp. Sta. at Agricultural College, Bul. No. 16, September, 1891, glanders.

NEW JERSEY—Exp. Sta. at New Brunswick, Bul. No. 84, October 10, 1891, ground bone and miscellaneous samples.

NEVADA—Exp. Sta. at Reno, Bul. No. 13, October, 1891, sugar beet experiments.

NEW YORK—Cornell Exp. Sta. at Ithaca, Bul. No. 32, October, 1891, tomatoes, Bul. No. 33, November, 1891, wire worms.

NORTH CAROLINA—Exp. Sta. at Raleigh, Bul. No. 80b, September 15, 1891, meteorological summary for North Carolina, August, 1891; Bul. No. 80d, October 15, 1891, meteorological summary for North Carolina, September, 1891; Bul. No. 80, October 1, 1891, silos and silage; Bul. No. 80c, October 30, 1891, the digestibility of cotton-seed hulls, and of a ration of cotton-seed hulls and cotton-seed meal, comparison of composition and digestibility of wheat straw and cotton-seed hulls, the fertilizing constituents recovered in manure in these experiments.

OHIO—Exp. Sta. at Columbus, Vol. IV, Bul. No. 6 (second series), October, 1891, experiments with small fruits in 1891, diseases of the raspberry and blackberry: Vol. IV, Bul. No. 7 (second series), November, 1891, the Hessian fly.

OREGON—Exp. Sta. at Corvallis, Bul. No. 12, comparative test of strawberries for 1891, meteorological summary; Bul. No. 13, mineral and mineral water analyses, soils and agricultural survey; Bul. No. 14, notes on insects: Circular No. 1, weedy plants.

PENNSYLVANIA—Exp. Sta. at State College, Bul. No. 17, October, 1891, the value of cotton-seed meal as compared with bran for the production of butter.

RHODE ISLAND—Exp. Sta. at Kingston, Bul. No. 12, August, 1891, analyses of commercial fertilizers collected under the State inspection, 1891.

SOUTH CAROLINA—Exp. Sta. at Fort Hill, Bul. No. 2 (new series), July, 1891, cotton experiments with varieties and with fertilizers.

WISCONSIN—Exp. Sta. at Madison, Bul. No. 29, October, 1891, creaming experiments.

SOUTH CAROLINA—Exp. Sta. at Fort Hill, Bul. No. 3 (new series) October, 1891, analyses of commercial fertilizers.

TENNESSEE—Exp. Sta. at Knoxville, Vol. IV, Bul. No. 4, October, 1891, some fungous diseases of the grape.

UTAH—Exp Sta. at Ogden, Bul. No. 9, December, 1891, time of watering horses, whole *vs.* ground grain for horses.

WYOMING—Exp. Sta. at Laramie, Bul. No. 3, November, 1891, the sugar beet in Wyoming.

CANADA—Ontario Exp. Sta. at Guelph, Bul. No. 70, December 1, 1891, feeding grade steers of different breeds.

CATALOGUES ACKNOWLEDGED.

JOHN LEWIS CHILDS, Floral Park, L. I., N. Y.: A descriptive and illustrated catalogue of flower, vegetable and agricultural seeds; flowering bulbs and plants; hardy ornamental shrubs; small fruits and fruit trees, and many novelties and special collections. This is a gorgeously illustrated pamphlet with a large number of colored plates.

E. S. & F. BATEMAN, Grenloch, N. J. Illustrated and descriptive catalogue of the Iron Age farm and garden implements, comprising cultivators, horse hoes, harrows, plows, seed drills, trucks, carts, and other implements manufactured by this company.

BARTELDES & Co., Lawrence, Kans.: Illustrated and descriptive catalogue of garden, flower and field seeds; nursery stock, implements, etc., etc.

CHADBORN & COLDWELL MANUFACTURING CO., Newburgh, N. Y.: Trade Circular of the celebrated mowers and rollers manufactured by this company.

ELLWANGER & BARRY, Rochester, N. Y.: Advance circular of general nursery stock for immediate and early spring planting.

G. H. GRIMM MANUFACTURING CO., Hudson, Ohio: Illustrated and descriptive catalogue of the Champion evaporator, Regulator Syphon for maple, sorghum, and fruit jellies. The large number of testimonials as to the excellence of this machine are a better indorsement than a lengthy description could give.

STEPHEN HOYT'S SONS, New Canaan, Conn.: Descriptive circular of the famous Green Mountain Grape, introduced by this firm. A large number of testimonials bear witness to the excellence of this new grape.

PETER HENDERSON & Co., New York City: Manual of everything for the garden. This is a large and very handsome pamphlet of over 150 pages, far exceeding the expectations for a seed catalogue. While it presents the most complete list of vegetable, flower, ornamental and flowering plants, bulbs, fruits, implements, etc., it gives also reliable instructions for the care of most of the kinds described. The covers, as well as several other colored plates interspersed throughout the pamphlet, are exceedingly beautiful and artistic.

THE KEYSTONE MFG. CO., Sterling, Ill.: Catalogue of agricultural implements, illustrating and describing the Keystone Dise harrows, corn planters, drills, cider mills, huskers, cutters, horse powers, etc.

MAPES FORMULA & PERUVIAN GUANO CO., New York City: Special catalogue orange, truck and tobacco manures, and how to use them.

PLANT SEED COMPANY, St. Louis, Mo. Illustrated and descriptive catalogue of garden, flower and field seeds. A very large and carefully selected collection.

J. M. THORBURN & Co., New York City: Descriptive and illustrated catalogue of seeds for the vegetable and flower garden, the lawn, the farm and the nursery. It is stated that it is the largest collection in the world. A list of new and rare varieties, comprising many promising novelties. The directions for the cultivation of the varieties given are remarkably clear and concise, and of practical value to gardeners and farmers.

DEVICE FOR OILING WHEELS.—Harris & Vallejo, Napa City, Cal., inform us that they have obtained letters patent for an improvement in devices for oiling wheels which covers the contrivance published in our August number. The party who sent us the sketch stated that the contrivance was in general use in his locality, which led us to suppose that it was not patented. Under the circumstances, we advise our readers who wish to use the device to correspond with the patentees, whose address is given above.

What Our Subscribers Say.

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MORGAN K. BANNING, Park Co., Col.

AMERICAN AGRICULTURIST
FOUNDED IN 1842
FEBRUARY. 1892.

The Washburn-Hatch Anti-Option Bills.

The revised bills introduced in the Senate by Mr. Washburn, of Minnesota, and in the House by Mr. Hatch, of Missouri, January 13th and 11th respectively, are free from many of the objections to the measure originally introduced and epitomized in the AMERICAN AGRICULTURIST for January. The scope of the new bills is extended to raw cotton, hops, wheat, corn, oats, barley, rye, pork, lard, bacon or other edible products of swine, grass seeds and flaxseed. Cattle and cattle products may also be included so as to guard against fictitious speculation in packed beef.

The measure provides that only owners of the articles named, or farmers having such articles in actual course of production, shall be authorized to sell such articles for future delivery without paying a specified internal revenue tax upon the articles so contracted to be sold and delivered by one not the owner thereof. The license fee and tax is unchanged, but the details for the regulation and collection of such taxes are given more fully. The taxes are to become due and payable upon the making of the dealer's weekly report, or upon the day provided for the return of such report. The penalty of violating the proposed law is increased to a fine of not less than $1,000 or more than $10,000, or imprisonment for not less than six months or more than ten years, or both.

Great opposition was aroused by the first bill introduced, because it was claimed to interfere with legitimate trade. The revised measure accommodates such transactions, without weakening the law regarding fictitious dealings. It is provided that parties making contracts for the sale and future delivery of any of the articles named, which they claim to own at the time of making such contracts, shall not be taxed upon such articles included in any "owner's contract," as defined by the act, provided they present proof to the collector of such ownership in a manner the act prescribes. In case of failure or refusal to make the required proof, such contracting party shall pay the same tax as is required from the dealer in options of futures.

How to Advance the Work.

The AMERICAN AGRICULTURIST has prepared petitions to Congress in favor of the principle of the Washburn-Hatch anti-option bills, which with explanatory circulars will be sent free to all persons interested in advancing this important reform. The petition represents that the practice on boards of trade and exchanges of offering and selling, in destructive competition with the products of the farm, unlimited quantities of fictitious products, results in preventing the free operation of the law of supply and demand. It depresses prices. It greatly lessens the power of the farmer to purchase the products of others. It thereby brings enforced idleness and poverty to great numbers of the industrial classes. In consequence, it causes a chronic condition of commercial stagnation. The circulars accompanying the petitions give more details. In order to obtain them it is only necessary to address a postal-card request to "AMERICAN AGRICULTURIST, New York," for its outfit to prevent speculation in fictitious farm products.

The Magnitude of the Evil.

The determined effort to tax out of existence the dealing in "options" and "futures" of fictitious products has brought out a whirlwind of criticism from the middlemen interested. The Minneapolis, Chicago and other boards of trade are organizing a great campaign against the bill. These critics claim that it is impossible to distinguish the actual from the fictitious transactions, and that to prevent short selling will upset established business methods.

A most eminent and disinterested authority on this subject, Mr. C. Wood Davis—whose knowledge of the kindred subject of the world's food supply was emphasized by his epitome in our January number—has made partial answer to such criticisms. He believes that this form of speculation is bad for the farmer and a cause of much of the depression in other lines of business. He shows that less than ten per cent. of our wheat and corn reach the interior board-of-trade markets, including the great quantities counted twice in transit. The remainder of our vast production is distributed to the consumer direct from the smaller country markets. Thus the farmer sells nine-tenths, even of his grain, without the aid of board-of-trade methods. Nearly all his other products are sold directly without such aid, although the short-seller is able to determine the price of the farmers' hogs by levying toll on packing-house products. The devices applied to dealing in futures and options enable the speculators, who manipulate only one-tenth of the crop, to determine the price at which the entire product shall be sold. Hence the farmer would be better off, as would the whole community, if this tenth and the manipulators' prices were obliterated.

The farmer usually sells his grain to a buyer in the nearest country town, who ordinarily buys it on commission for some city dealer. This dealer usually sells hundreds of bushels "short" for every bushel he buys. Many of the short sellers never own a bushel of grain or other product that they sell short. This fact is emphasized by the enormous amount of such sales which daily run through and are settled by the "ringing out" or clearing-house process, in which the trades are adjusted by the payment of differences. Thus of the millions of bushels of grain sold upon the Chicago board of trade for September delivery, the actual deliveries, when these contracts matured, were less than 100,000 bushels of wheat and corn.

Nothing is more fallacious than the claim that this species of speculation helps to boom the market when otherwise it would be dull and prices low. The visible supply has averaged much less since this practice of short selling became so general, showing that it results in actually less market for real products. This is easily accounted for by the fact that no one can safely buy these products for investment, when their value is destroyed by the offerings of unlimited quantities of fictitious grain. These offerings affect prices just as though they were real. Moreover, it is when prices are low and the market sluggish that the short seller gets in his worst work and does the greatest injury.

The world requires something more than 7,000,000 bushels of wheat daily. If the amount offered for sale exceeds that required, the excess of such offerings will depress prices. The fact of such large offerings, be they real or fictitious stuff, is accepted as an indication that there is a surplus of wheat. Thus the enormous load of actual corn following the large yields of 1888-9 was supplemented by 100 times as much fiat corn, the result being that prices in the western part of the corn belt dropped to ten cents per bushel, yet after a few months—the next crop being deficient—the crop advanced to sixty-five cents.

It is an axiom in works on prices that a deficiency of ten to fifteen per cent. in supply would advance prices of necessities from 100 to 300 per cent. As with other economic laws, the converse is true when the conditions are reversed. But these offers of fiat product have not permitted the operation of this law, since the short seller can and will multiply an abundant crop with the costless product of his lungs. Hence, the world is constantly seeing more wheat offered than it requires, and prices cannot advance until the actual pinch of scarcity shows that this lung product has no great nutritive value.

These speculators probably offer more wheat every week than the world ever consumed in one year. Mr. Davis in one hour counted offers on the floor of the Chicago board of trade that exceeded 300,000,000 bushels, and was unable to count the half. It is safe to say that the amount offered on that one board is ten times the whole world's requirements. But one result can follow such excessive competition of fictitious with actual products.

Again, the American producer is forced to insure a profit to the British merchant on all the wheat and cotton he imports. The farmer has to do this without getting anything for assuming the risk, though the farmer's own product is diminished in value. Still it is true that the Englishman pays an enormous sum to the American short seller as commissions for effecting his short sales. The thing is worked in this way. When the Englishman buys a cargo of wheat or cotton in India or Russia or elsewhere, he sells a like quantity "short" through some commission house. In case the price goes down, in consequence of these short sales, the loss falls upon the American farmer, while the British merchant has a profit on his short sales, and is thus insured against a possible loss on every purchase of actual product. If the price goes up, he has a loss upon his short sales against an advance of an equal amount on the actual product that he holds. In any event he has the ordinary mercantile profit from such operations. That is, he always stands to win no matter which way the market may go, while his short sales beat down the price of the farmer's crop.

The short seller or dealer in options and futures does not add one consumer or hasten

by one moment the consumption of a single pound of the products of the farm. The farmer formerly sold all his stuff without this system and can do it again. Indeed, the sales in the great markets ten years since are larger than now, as we then exported a much larger proportion of the crop, and less was distributed directly from the farm markets.

How the Practice Has Developed.

Grain and grass seeds, packing - house products, coffee and oil, also hops within a few weeks, have been selected for this form of speculation, because it was possible to establish grades of these products by inspection which cannot be done with such things as hides, butter, potatoes, etc. The grade established, it is easy to fix a price at which a certain quantity thereof shall be delivered at a definite time in the future. Then the gamblers sell such grades "short," or, in other words, bet that it will be worth so many cents, or that it will not, at a named time. The grades known as "contract" grades are such as represent the great bulk of products dealt in during an ordinary season. The grades were originally so fixed that the market would be difficult to "corner," being originally thus designed that the honest seller could always be sure of finding the article in sufficient quantity to fill his contracts.

All these contract grades can be sold without the aid of the short seller. So can the grades which are not contract, and which in some seasons represent the bulk of some kind of grain. The seller of these low grades has no difficulty in disposing of a grain by sample, no matter what may be its quantity or value. Indeed, these low grades sometimes sell for more than the short sellers asked for the higher quality. This emphasizes cleaely how these gamblers help the farmer—to a low price for his best grain.

Trading in options and futures was introduced gradually. It became a disturbing factor in the earlier years of the last decade. At first, short sales were made only for the current month. But it was soon found out that this brief limit enabled the larger operators to run corners. Hence, the time of delivery was extended to the next month and later to many months ahead. Operators have found the business very profitable, while it has all the enticing qualities of gambling. That is why they oppose the Washburn-Hatch bill to tax it out of existence.

The commission on short sales of fiat wheat, oats and corn is one-eighth of one cent a bushel. The commission charged the farmer and others by these benevolent friends of his, for the sales of his actual wheat, is one cent a bushel and half a cent a bushel for corn and oats. When fiat sales are converted or changed into actual sales, the higher rate is then charged. If, therefore, the annual short sales of grain amount to twenty billion bushels, the commissions would be $2,500,000. A like estimate may be made for commissions on short sales of cotton and other products. Indeed, the commission houses which make a specialty of this form of gambling for their patrons, probably receive five million dollars a year from this source alone. Whatever the amount may be, it accounts for the opposition which these brokers' gamblers have to the pending bill.

Again, gamblers are more ready to advance the one-eighth of a cent commission of fictitious grain than the larger amount on the actual product. This greatly increases a business that deals with an illimitable product. It induces the "lambs" to "blow in" more money, and thus increases the harvest of the board-of-trade manipulators.

The best possible evidence that such operations do not benefit the farmer is found in the fact that probably ninety per cent. of them result in profits to the "bear" side. Every disinterested person who has investigated the question has no doubt that the proposed law would benefit every miller and all other legitimate dealers, as well as every farmer. These gamblers, who oppose the suppression of their trade, parade as the farmers' friends, but say not a word about their enormous revenues from these fraudulent transactions. They are content to denounce the whole thing as a wrong upon the poor deluded farmer who is crying for it, but they have not yet pointed out any wrongful clause in the proposed measure, or suggested any substitute that will cure the evil.

The fact of the matter is, a few hundred commission houses—a polite title for these brokers' gamblers—are depressing and fixing the value of several of our most important products by the methods above described, although they actually handle less than one-tenth of the annual production. To save the enormous revenue, derived from their commissions on fictitious transactions, they are now posing as the farmers' friends. The whole thing is a species of legalized gambling that has developed within a few years. Legitimate commerce did not require it formerly, and does not need it now. It should be wiped out of existence.

Like it More and More.—I have taken the AMERICAN AGRICULTURIST several years, and like it more and more every year.
ELIJAH KELLOGG, Cumberland Co., Me.

American Produce Exports.

The value of breadstuffs (barley, corn, oats, rye, and wheat, ground and in the grain) exported from the United States, in 1891, reached the magnificent total of $224,319,500 in value, against only $136,845,896, in 1890. This total has been exceeded but twice in our history, 1880-1, when it amounted to two hundred and eighty-eight and two hundred and seventy millions of dollars. The total value of our beef, hog and dairy products exported last year was $120,941,929, against $131,375,044, in 1890. How this compares with previous years appears from Table No. 18, on Page 80 of the AMERICAN AGRICULTURIST for January. The movement of the new crops to foreign markets compares with previous years as follows:

PROVISION EXPORTS.

[Last 000's omitted in all cases.]

	December.		*4 mos. Dec. 31*	
	Quan.	*Value.*	*Quan.*	*Value*
Cattle, No. 1891	25	$2,205	167	$14,851
do " 1890	37	3,044	205	16,484
Hogs, No. 1891	1	12	*7	59
do " 1890	7	54	25	199
Canned beef, lbs. 1891	10,058	889	†19,031	1,671
do " 1890	19,303	1,539	28,414	2,323
Fresh beef, lbs. 1891	19.144	1,510	†37,021	2,902
do " 1890	17,488	1,390	32,340	2,511
Salted, pickled and cured beef, lbs. 1891	5,375	314	†10,954	638
do " 1890	11,597	671	19,940	1,184
Tallow, lbs. 1891	8,247	405	†15,317	762
do " 1890	11,033	543	17,440	858
Bacon, lbs. 1891	52,387	4,043	†84,872	6,541
do " 1890	44,519	3,260	83,636	6,167
Hams, lbs. 1891	5,987	609	†12,246	1,351
do " 1890	6,495	662	12,347	1,222
Pork, lbs. 1891	6,213	369	†11,702	686
do " 1890	7,013	409	14,263	827
Lard, lbs. 1891	49,925	3,615	†86,187	6,243
do " 1890	60,555	4,135	90,744	6,279
Total, 1891	.....	11,753	†20	794
do 1890	.....	12,609	21	371
Butter, lbs. 1891	698	130	‡11,614	1,843
do " 1890	851	124	15,704	2,053
Cheese, lbs. 1891	2,237	228	64,248	5,939
do " 1890	4,787	447	77,628	6,859

Total, 1891, $359 1890, $571 1891, 7,781 1890, $8,911

*Six months. †Two months. ‡Eight months.

BREADSTUFFS EXPORTS.

	December.		*6 mos. to Dec. 31*	
	Quan.	*Value.*	*Quan.*	*Value.*
Barley, bush., 1891	569	$387	1,895	$1,231
do " 1890	39	28	276	191
*Corn, bush., 1891	6,229	3,456	18,215	12,032
do " 1890	2,321	1,043	18,295	9,831
†Oats, bush., 1891	2,867	1,215	4,808	2,180
do " 1890	33	24	1,282	360
Rye, bush., 1891	905	907	7,883	7,465
do " 1890	30	22	323	203
Wheat, bush., 1891	15,663	16,686	95,121	99,691
do " 1890	4,772	4,155	22,975	20,386
W. flour, bbls., 1891	1,527	7,621	6,615	33,390
do " 1890	1,052	4,854	5,013	23,735
Total as wheat, 1891	22,534	24,307	124,887	133,081
do " 1890	9,512	9,009	45,420	44,121
All breadstuffs 1891		30,242	.....	155,989
do 1890		10,127	.....	54,806

*Includes corn meal. †Includes oatmeal.

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Sterculias. — The article on Kola nuts in the December number of the AMERICAN AGRICULTURIST reminds me, writes Prof. W. F. Massey, of North Carolina, to say that one species of *Sterculia, S. platanifolia*, thrives well in Raleigh where there are a number of handsome specimens of this tree. Their broad sycamore-like leaves in summer make them a fine shade tree, while their rapid growth makes them desirable. Even in winter they attract attention by their smooth, green bark and the rugged abruptness of their branching. They grow easily from seed and soon make fine specimens. How much further North they are hardy I cannot say, but they are perfectly hardy here, and the oldest specimen is now a large tree.

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In every State and Territory people engaged in various occupations are canvassing, during their leisure moments, for subscribers to the AMERICAN AGRICULTURIST with surprising success and considerable profit to themselves. But more canvassers are wanted in every locality, in every school district, and in every State and Territory in the Union. We also desire active canvassers in the Provinces and foreign countries as well. To all we can furnish profitable employment. Let us hear from you. Write us at once for particulars, full instructions, and canvassers' outfit.

But One Month Remains if You Wish to Share in Our Award of

$1250 IN CASH FOR THE LARGEST CLUBS
OF NEW SUBSCRIBERS!

We offer and will distribute March 1st, 1892, $1,250 in cash among the 40 canvassers who send us the 40 largest clubs of NEW subscribers previous to March 1, 1892. Following is a list of the cash prizes offered:

$150 for the largest club,	$150
100 each for the next two largest clubs,	200
75 each for the next four largest clubs,	300
50 each for the next four largest clubs,	200
25 each for the next four largest clubs,	100
15 each for the next ten largest clubs,	150
10 each for the next fifteen largest clubs,	150
40 prizes to the amount of	$1250

Remember, these special prizes will be presented in addition to the premiums, or commission, allowed for every club of subscribers procured. It makes no difference how large or how small the club is, the person sending the largest number of subscribers before March 1st will receive the first prize of $150; the persons sending the second and third largest clubs will receive $100 each, and so on for the balance of the prizes. We will forward each club-raiser the full list of the successful contestants when the award is made.

Conditions of This Award.

This contest is open to everybody **except newsdealers, newspapers and subscription agencies,** who procure subscribers for various publications by catalogue, or otherwise, from all sections of the country.

Contestants may send subscribers from any number of post offices, but they must be confined to one or more adjoining counties.

Two or more canvassers cannot unite and count their lists as coming from one person, as these prizes are given for individual effort.

It is not necessary that canvassers should notify us that they intend to compete for these prizes. Everybody sending clubs will be credited for all subscribers procured and have a chance for one of the prizes.

Now, friends, put your shoulder to the wheel and give us a handsome increase of subscribers for 1892. We offer a splendid selection of premiums for every club you forward (see Premium List in November issue), and those who send the 40 largest clubs will, in addition, participate in the award of the special cash prizes.

You cannot work for a better publication than the AMERICAN AGRICULTURIST. Its superior excellence, together with its great reputation, gained by fifty years of continuous publication, makes it one of the easiest journals to canvass for. All our promises will be carried out in every respect. Send for full instructions and canvassers' outfit.

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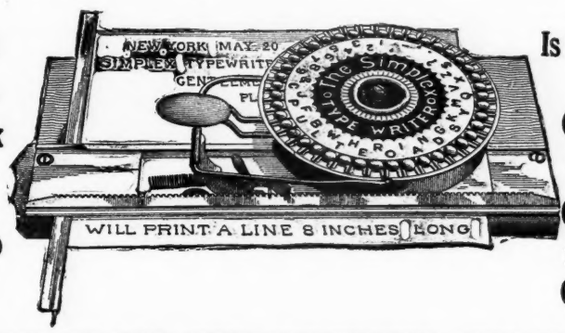

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It is positive in action and each letter is locked by an automatic movement when the stroke is made.
It has no ribbon to soil the fingers.
Letters written by it can be copied with a letter press.
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Gold Breastpin. Beautiful gold front Breastpin with moonstone, around which cluster a reproduction of the finest real diamonds.

Watch Charm. This is a handsome rolled gold watch charm with real intaglio stone.

Woodward's Improved Washer-Cutter. With this improved washer-cutter any circle, from that required by the smallest hose packing to an ordinary pump-box, can be cut.

Ladies' Gem Shopper. Imitation seal closely resembling the genuine article; it contains three distinct pockets, leather-lined, a coin pocket with ornamental rim and clasp, and finally, a pretty memorandum tablet and pencil. Well made and durable.

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Premiums for One New Subscriber. (Continued.)

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Self-Lighting Pocket-Lamp. Made of brass, highly finished, nickel-plated, and warranted to work; 200 extra lights are included—put up in a finely finished brass case.

Box of Colgate's Perfumes. A neat box containing four bottles of Colgate's Celebrated Perfumes, four distinct odors, namely: Cashmere Bouquet, Heliotrope, Ylang Ylang and Violet.

Napkin Ring. One of the celebrated William Rogers Manufacturing Company's make, quadruple plate; standard quality, and in the latest design.

American Agriculturist Jackknife. Has two blades of the highest quality razor-steel; every blade is file-tested and known to be good before sending out.

French Bisque Doll. The head of this doll is of real French Bisque, the body is jointed at neck, shoulders, and hips, allowing it to assume almost any position. It has long hair, a pretty face, and is about 9 inches high.

"Dictator" Concert Harmonica. The superiority of this improved harmonica lies in the peculiar construction of its reed cells, but a small amount of air being required to play it successfully. It has double holes, 10 in number, double silver reeds, nickel covers and nickel-plated plates.

Vacuum-Tipped Arrow Pistol. The Vacuum-Tipped Arrow consists of a concave feather-edged disk, so soft and flexible that it can be shot with safety even at your window, in the parlor or nursery, without injury to furniture or to the person of any one. But the great novelty of this invention consists in the fact that the Vacuum-Tipped Arrow adheres to the smooth surface of any object to which it is shot, such as glass, painted walls, and especially the Graduated Target which accompanies each Pistol.

Your Choice of the Following Given for One New Subscriber and Ten Cents Additional.

Ladies' Two-Blade Pearl Penknife. A beautiful penknife for ladies. The largest blade is made for ripping seams or cutting leaves of books.

The Premium Drill. With wrench and six drill points. Many delicate pieces of scroll-work, requiring hours to saw out, are ruined in putting together, for lack of proper tools. This drill will be found invaluable after once using.

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Memorandum and Bill Book. Good and substantial for farmers and merchants; made of good Russia leather, firm and soft, has 5 pockets for money, 2 for stamps and tickets, and a memorandum book with place for pencil. It is 7½ inches long and 3½ inches wide.

Child's Decorated China Tea-Set. Attractively decorated with floral designs in bright colors and bordered with blue, on a snowy white ground; consists of 22 pieces. The plates are 2¼ inches in diameter, the other pieces in proportion, carefully packed in a strong woodbox.

The Perfect Buttonhole Scissors. Has an adjustable screw between the handles. Can be set to cut any size buttonhole. Nickel-plated.

Ladies' Work-Box Package. Contains the following: Sewing and Embroidery Silk, red Embroidery Cotton, French White Embroidery Cotton, Zephyr Worsted, black Linen Thread, Dorcas Darning Cotton, Silk Thread, buttonhole Silk Twist in colors, buttonhole Silk Twist (black), "Rickrack" Braid, white Feather-Edge Braid, Novelty Braid, Imperial Hairpins, Invisible Hairpins, Safety Pins, Needles—one paper ranging from "5s" to "10s" in sizes, the other paper all No. 7, and both having the patent elliptical eye. Lace Pins, Steel-wire Buttonhook, Steel Crochet Needle, White Bone Crochet Needle, with hook at either end and different sizes. No less than 25 distinct articles in all. All the articles in this combination are staple, salable goods that every lady can use to advantage.

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Clamp Vise with Anvil. The jaws and bars are ground and polished, the screw and lever made from best Bessemer steel. The jaws are one and one-half inches wide, and will open to take in and firmly hold anything up to two inches in diameter. It can be carried in the pocket, or can be fastened to a table, bench or board by means of the thumb-screw and clamp.

Gold Chain Bracelets. Handsome, extra gold-plated Bracelet with padlock fastening. The padlock, handsomely chased.

Your Choice of the Following Given for One New Subscriber and Fifteen Cents Additional.

Ladies' Rolled Gold Watch Chain and Charm. Of great beauty and excellent workmanship.

Excelsior Fruit and Vegetable Press. Straining Fruit and Vegetables made easy. The handiest kitchen utensil ever made.

Gold Finger Ring. A solitaire diamond cut brilliant, so like a real diamond that it takes a dealer to tell the difference.

Plush Handkerchief Case. Will hold a dozen handkerchiefs. It is of delicate shades of plush, hand painted and satin lined.

Baily's Shampoo Brush. Made from a sheet of pure Para rubber, one side being formed into cylindrical teeth, with a flat end, and the whole as soft and pliant as a silk handkerchief.

Initial Cuff Buttons. These rolled gold-plate cuff buttons can be ordered in any initial. The initial is polished gold, while the main part is Roman gold. The back has a patent lever so that it can easily be inserted into the cuff.

Favorite Building Blocks. The set contains 50 pieces of many different shapes and sufficient to build most elaborate models. They stand firmly and don't upset. Securely packed in a beautiful colored box and on the inside of the cover of each is a diagram showing some of the best and most striking combinations which the blocks will make.

Sargent's Patent Awl and 10 Tools. Of the best quality, made of superior cast-steel, as follows: Four Brad-Awls, one Gimlet, one Gouge, one Screw-Driver, one Tack-Puller, one Chisel, and one Reamer, in polished applewood handle.

The Harmonica Flageolet. It has eight valves or stops, each of which controls two notes, thus giving a range of 16 notes. Easily learned by the aid of the chart of instructions which accompanies each one.

"Relief" Fountain Pen. The fountain holder is of vulcanized rubber and holds ink sufficient to write 100 pages. It is fitted with a first-class shading pen with smooth flexible points, and is perfectly simple in its adjustments. Any good fluid ink can be used.

Extra Strong Two-blade Jackknife. It is the best knife for hard service and rough work that was ever made, blades are extra thick, oil-tempered, and every one tested by file before polishing.

Pair of Seymour's Steel Shears. Nickel-plated blades made of the best steel, with maroon-japanned handles. Every pair is stamped with the manufacturer's trade-mark, and we warrant them in every respect. Length, 8 inches. We will replace any pair found imperfect.

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Gold Finger Ring. One of the neatest and most refined we have ever seen.

Your Choice of the Following Given for Two New Subscribers at the Club Rate of $1.00 a Year.

Individual Pepper and Salt Sprinklers. Are made in imitation of handsome chickens, and are entirely new; triple silver-plate, making a pleasing appearance. We do not break the pair, which are securely packed in a handsome box.

Simple Microscope. Magnifies 6 to 25 diameters and 36 to 625 areas. For Practical use. Lenses carefully ground and thoroughly made (not molded glass). Directions for using the Microscope, profusely illustrated, accompany each instrument.

Ladies' Rolled Gold Chain with Charm. The chain is carefully made, the pattern is a peculiar and delicate one, closely imitating the most expensive solid gold chains. The chain is flat, sets well about the neck, and is clasped securely by a patent device in the form of a ring. The charm is of medium size, set with a handsome, finely cut stone with raised leaf-like ornaments around it. Each chain comes in satin-lined box.

The Micrograph. The lense will show plainly the living parasites on the body of a fly, the scales on a butterfly's wing. We furnish with each instrument a set of glass slides, containing in all 100 separate and distinct pictures. These pictures are photographed on glass. They include pictures of childhood, love scenes, comic and pathetic pictures; in fact, variety enough to suit all tastes.

Set of "Konogin" Mouth Harmonicas. They have silver reeds, brass plates, nickel covers, and come in a set of four packed in a neat case.

Pincushion and Jewel Case. This is a metal box, measuring 4½ x 3¾ inches, silver-plated and oxidized, lined with satin and has a heavily-padded cushion cover. The silver is very richly wrought and will not tarnish.

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Six Carving Tools. We send six carving tools with rosewood handles, forged from the best quality of steel, fully warranted, and sharpened ready for use, in a black walnut case, in which they are sent.

Moody's Tailor System of Dress-Cutting. Teaches how to cut and make Ladies' and Children's Garments, at the same time enabling you to make all variations of the same garment, from the plainest to the most elaborately finished. Complete instructions are sent with each System.

Darkey Savings Bank. Made of sheet metal stamped in relief and hand-painted in exact imitation of a plantation shanty, and contains clock-work, main-spring and fan regulator, so arranged that when a penny or nickel is pushed through the coin-safe opening, the banjo-player will "pick on de ole banjo," while the other darkey will dance a real break-down. This safe has a metal door with post-office lock and key, so that all money pushed in is in safe keeping for its owner.

Mathematical Instruments. Contains 15 pieces, among which are Compasses, a compass extension, a drawing or ruling pen, an arm extension, a crayon holder, a metal protector, a wood rule, etc.

The "Defender" Seven-Shot Revolver. It is 22-caliber, long range, heavily nickel-plated, and has self-acting revolving cylinder. The stock is of polished hard wood, the barrel, cylinder, etc., of steel, heavily nickel-plated. The invention of new and improved machinery for their manufacture, now renders it possible for us to supply to our subscribers this good revolver upon the very liberal terms offered.

The "Yankee Whittler." A strong three-blade knife. Blades oil-tempered and hand-forged from razor-steel, then file-tested.

Three-Blade Pearl-Handle Knife. Has pearl handle, German silver ends, round corners. The blades are finished in the very best manner, and can be put in perfect edge.

"Common Sense" Pruning-Knife. Contains a pruning blade, a jackknife blade, a budding and spaying blade. The blades are carefully forged from razor-steel, file-tested, and will be replaced without extra charge if soft or flawy.

Crocheted Silk Scarf Outfit. Comprises one ounce (two balls) of Corticelli Crochet Silk, one nickel-plated crochet needle and a valuable book of instruction containing 96 pages, fully illustrated; subjects crocheted scarfs, silk slippers, silk belts, silk suspenders, macreme lace, embroidery, etc. A choice of colors may be had as follows, viz.: Black, white, navy blue, garnet, and lavender.

The Hand-Embroiderer. The Hand-embroiderer is a new machine for doing Colored embroidery by hand. It is specially designed to work fine silk and other embroidery threads, arrasene, filloselle, etc., such as have never before been wrought by mechanical means. Full directions go free with every machine.

Mammoth Double Stamping Outfit. Contains 150 Patterns. All the patterns are made in an artistic manner, especially for us. With each outfit we also include one tube Ingalls' stamping-paint, used for stamping plush, velvet, felt, etc.; one stamping-brush; one box powder; one stamping-pad; one book of full instructions for using this outfit; one illustrated book telling how to make all the popular stitches.

Ladies' Work-Box with Kensington Stamping Ouifit. Each outfit is packed in an Inlaid Wood Work-Box which has brass hinges, a self-locking lock, and is inlaid with a variety of fancy woods, and piano polished. Each box contains 1 Book, Instruction in Stamping and Fancy Work; 1 Book, Knitting and Crotcheting; 1 Book, Language of Flowers; 1 Book, Crazy Patchwork Series; 1 Steel Bodkin; 1 Steel Bodkin; 1 Paper English Needles; 1 Patent Glove Buttoner; 1 Patent Boot Buttoner; 1 Steel Crochet Needle; 1 Ivory Crochet Needle; 1 Packing Needle; 1 Silver Thimble; 158 Perforated Stamping Patterns; 1 Box Stamping Powder; 1 Patent Ponset, for applying powder; 1 Box Hairpins; 1 Box Black Pins; 1 Box of White Pins; 1 Box Safety Pins; 1 Box Black Headed Pins; 1 Package Black Hooks and Eyes; 1 Package White Hooks and Eyes; 1 Spool of Black Thread; 1 Spool of White Thread.

Political and U. S. Map Combined. Lastest Edition. Corrected to Date. Printed in eleven colors. This Double Map contains on one side: Rand, McNally & Co.'s latest U. S. Map, showing all Counties, Railroads, Towns and Post-offices; and on the other side: Houghton's Political Map, printed in seven colors, with a number of other Maps, Diagrams and Pictures. The complete Reversible Map is printed on both sides, is 3 feet 10 inches by 5 feet 16 inches, and is mounted on rollers, top and bottom, with tape on sides.

The Peerless Atlas of the World. 130 pages, each 14 by 11 inches. Over 200 Large Maps and Illustrations. It gives the population of each State and Territory, of all Counties of the United States, of American Cities with over 8,000 Inhabitants, by the Census of 1890.

Les Miserables. By Victor Hugo. Complete in one large volume of 1,165 pages, size 7¾ x 5¼ inches. A new translation, by Israel F. Hapgood, neatly bound in cloth, illustrated, and well printed in clear type. "Les Miserables" is one of the most thrilling stories extant, portions of history being cleverly woven with fiction.

Challenge Crosscut-Saw Set and Jointer. This combined tool is the result of years of practical saw-dressing. The perfect jointing feature of this set makes every tooth on a saw exactly the same length, and squares the saw's edge, so that every tooth cuts alike, and the saw cuts very fast, straight, and easy. The cut and instructions for jointing, setting, and filing saws, and for straightening "kinked" and crook saws, are alone worth $5 to saw owners. We send them free with each tool.

Pruning Shears. These Shears are 8⅝ inches in length. They have a bolt and nut making them very durable. The handles are glove fitting, especially molded to anatomy of the hand, thus rendering them very easy on the hand when in use.

Your Choice of the Following for Three New Subscribers at the Club Rate of $1.00 a Year.

A Torrey Razor. Extra Hollow-Ground. Each razor is thoroughly tested before leaving the factory, and will shave with ease the hardest beards.

Weeden's Magic Lantern. This new Magic Lantern, is especially adapted for photographic slides, the brilliant light bringing out sharply all the details.

Implement Set. A complete set of reloading tools, comprising a jointed cleaning rod, with the cleaning attachments to screw on the end; a closing machine; a loader with nickeled tube; a powder and shot measure; a ring shell-extractor, and a recapper.

Trocar and Bull Ring. The Trocar is a sharp-pointed instrument, furnished with a handle. The Cannular is a tube which fits over the Trocar. One of the uses of the combined instrument is to relieve cattle suffering with hoven, or stomach dangerously swollen or distended with gas. The Trocar and Cannular are also used for bull ringing. We supply a copper bull ring, 2½ inches in diameter, with screw-driver for putting together.

Combination Tool. In this combination are eight of such tools as are most frequently called for around the house, shop or barn. It is ingeniously constructed and finished in a workmanlike manner.

Premiums for Three New Subscribers. (Continued.)

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